

AD-A180 588

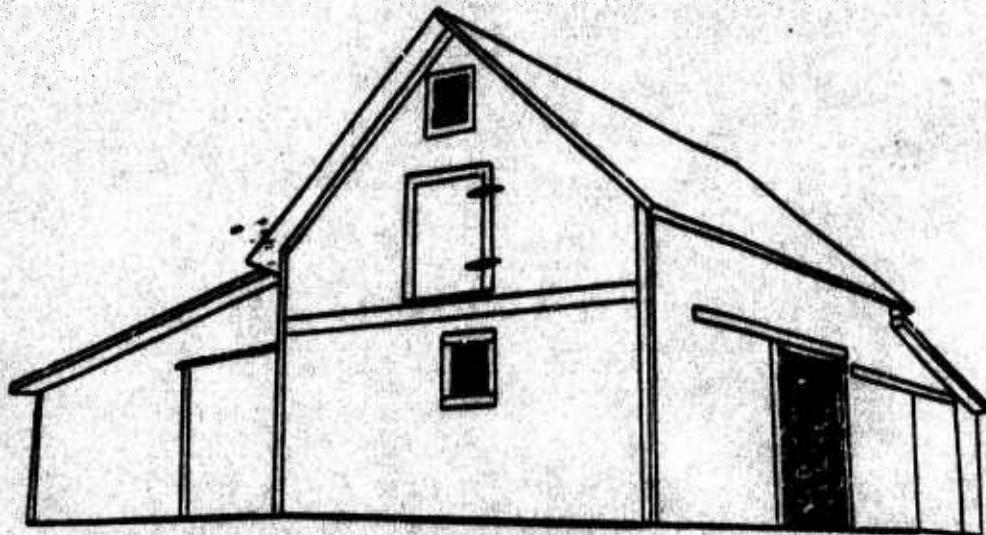
US Army Corps
of Engineers
Omaha District

DTIC FILE COPY

(3)

A Cultural Resource Inventory of the Left Bank of Lake Oahe: Burleigh and Emmons Counties, North Dakota

Volume I



DTIC
ELECTED
MAY 26 1987
S D
X D



Prepared by:
Larson-Tibesar Associates
421 South Cedar
Laramie, Wyoming

87 5 21 404

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
	ADA180588	
4. TITLE (and Subtitle)	5. TYPE OF REPORT & PERIOD COVERED	
A Cultural Resource Inventory of the Left Bank of Lake Oahe: Burleigh and Emmons Counties, North Dakota	Final	
7. AUTHOR(s)	6. PERFORMING ORG. REPORT NUMBER	
Thomas K. Larson, Kurt P. Schweigert, Keith H. Dueholm, Dori M. Penny	L/T-13-83	
9. PERFORMING ORGANIZATION NAME AND ADDRESS	8. CONTRACT OR GRANT NUMBER(s)	
Larson-Tibesar Associates 421 South Cedar Street Laramie, Wyoming 82070	DACW45-83-C-0243	
11. CONTROLLING OFFICE NAME AND ADDRESS	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS	
Omaha District, Corps of Engineers 6014 U.S. Post Office and Courthouse Omaha, Nebraska 68102		
14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office)	12. REPORT DATE	
	November, 1986	
	13. NUMBER OF PAGES	
	Vol I 156	
16. DISTRIBUTION STATEMENT (of this Report)	15. SECURITY CLASS. (of this report)	
Volume I: Availability unlimited Volumes II through IV: Not available for public release		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number)		
Archeology Anthropology Cultural Resource Management	Historic Preservation History Lake Oahe	Middle Missouri National Register of Historic Places North Dakota Predictive Modeling
20. ABSTRACT (Continue on reverse side if necessary and identify by block number)		
see reverse side		

(20)

ABSTRACT

An intensive cultural resource inventory was conducted on approximately 8200 acres of federal land adjacent to Lake Oahe in Emmons and Burleigh counties, North Dakota. Seventy-two sites and 23 isolated finds were recorded. Seven sites are believed eligible for nomination to the National Register of Historic Places. Further work is necessary to determine eligibility at 29 sites. Preliminary site patterning studies indicate that the modeling of site location is possible with a high degree of accuracy. It is believed that such modeling would be of use for long-term and short-term management and research concerns.

A Cultural Resource Inventory of the
Left Bank of Lake Oahe: Burleigh
and Emmons Counties, North Dakota

by
Thomas K. Larson
Kurt P. Schweigert
Keith H. Dueholm
and
Dori M. Penny

Principal Investigator and Editor
Thomas K. Larson

Report Prepared For:

Corps of Engineers, Omaha District
6014 U.S. Post Office and Courthouse
Omaha, Nebraska 68102

Contract #DACP45-83-C-0243

Report Prepared By:

Larson-Tibesar Associates
421 South Cedar
Laramie, Wyoming 82070

November, 1986



Accession For	
NTIS	CRA&I <input checked="" type="checkbox"/>
DTIC	TAB <input type="checkbox"/>
Unannounced <input type="checkbox"/>	
Justification _____	
By _____	
Distribution / _____	
Availability Codes	
Dist	Avail and/or Special
A-1	

TABLE OF CONTENTS

LIST OF FIGURES.....	iv
LIST OF TABLES.....	v
CHAPTER ONE	
INTRODUCTION.....	1
Sampled Areas.....	5
Documents Search.....	7
Previous Cultural Resource Work in the Area.....	8
Field Inventory Techniques.....	10
Artifact Analysis.....	12
Historic Field Methods, Description, and Evaluation Procedures	12
CHAPTER TWO	
ENVIRONMENTAL SETTING.....	15
Physiography, Geology and Paleoclimate.....	15
Climate.....	16
Soils.....	17
Vegetation.....	18
Fauna.....	22
Fieldwork Conditions.....	24
CHAPTER THREE	
RESEARCH ORIENTATION.....	25
CHAPTER FOUR	
PREHISTORIC/PROTOHISTORIC OVERVIEW.....	29
CHAPTER FIVE	
HISTORICAL OVERVIEW.....	37
The Fur Trade and Early Exploration.....	37
The Indian Wars Era.....	40
Transportation.....	43
Euroamerican Settlement.....	45
Impact of Oahe Dam.....	48
CHAPTER SIX	
CULTURAL RESOURCES ENCOUNTERED.....	50
Township 129 North, Range 78 West.....	50
32EM364.....	50
32EM366.....	54
32EM368.....	54
Township 129 North, Range 79 West.....	54
32EM1, the Havens site.....	54
32EM357.....	56
32EM360.....	56
32EM362.....	59
32EM363.....	59
IF LTA1383-10.....	61
IF LTA1383-13.....	61
IF CRMOAHE-2.....	61

IF LTA1383-14.....	61
Township 130 North, Range 79 West.....	61
32EM73.....	61
32EM101.....	63
32EM124.....	63
32EM125.....	64
32EM353.....	64
32EM354.....	64
IF LTA1383-11.....	66
IF LTA1383-12.....	66
IF LTA1383-15.....	66
IF LTA1383-16.....	66
Township 131 North, Range 79 West.....	66
32EM122.....	66
32EM123.....	68
Township 132 North, Range 79 West.....	68
32EM119.....	68
32EM120.....	68
32EM121.....	69
IF LTA1383-5.....	69
IF LTA1383-6.....	69
IF LTA1383-17.....	69
Township 133 North, Range 78 West.....	69
32EM6, the Horsehead Creek site.....	69
32EM109.....	70
32EM110.....	71
32EM111.....	71
32EM112 (Historic component).....	72
32EM112 (Prehistoric component).....	72
32EM113.....	74
32EM114.....	74
32EM115.....	75
32EM116.....	75
32EM117.....	75
32EM118.....	76
IF LTA1383-506.....	76
IF LTA1383-509.....	76
Township 134 North, Range 79 West.....	76
32EM7, the Badger Ferry site.....	76
32EM19.....	78
32EM21.....	78
32EM30.....	79
32EM93.....	81
32EM94.....	81
32EM95.....	82
32EM96.....	82
32EM97.....	82
32EM98.....	83
32EM99.....	84
32EM100.....	84
IF LTA1383-603.....	85
IF LTA1383-604.....	85
IF LTA1383-605.....	85
IF LTA1383-607.....	85
IF LTA1383-608.....	85
IF LTA1383-609.....	85

IF LTA1383-610.....	85
Township 135 North, Range 78 West.....	85
32EM88.....	85
32EM202.....	86
32EM203.....	86
Township 135 North, Range 79 West.....	87
32EM89.....	87
32EM90.....	87
32EM92.....	89
IF LTA1383-611.....	89
IF LTA1383-612.....	89
Township 136 North, Range 78 West.....	89
32EM10, the Shermer site.....	89
32EM80.....	90
32EM81.....	92
32EM82.....	92
32EM83.....	92
32EM85.....	93
32EM86.....	93
32EM87.....	94
32EM91.....	94
Township 136 North, Range 79 West.....	94
32EM11, the Glencoe site.....	95
32EM77.....	95
32EM78.....	96
32EM79.....	96
32EM84.....	98
32EM126.....	98
Township 137 North, Range 79 West.....	99
32BL1.....	99
32BL49.....	99
32BL52.....	100
Township 137 North, Range 80 West.....	100
32BL5, the Holbrook site (Prehistoric component).....	100
32BL5 (Historic component).....	102
32BL46.....	103
32BL47.....	103
32BL48.....	104
32BL50.....	104
32BL51.....	104
IF CRMOAHE-1.....	105
CHAPTER SEVEN	
ANALYSIS.....	106
Analysis of Site Distribution Patterns.....	106
Research Questions Relating to Temporal Affiliation.....	123
CHAPTER EIGHT	
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS.....	126
Density of Cultural Properties.....	126
Types of Cultural Resource Components Represented.....	126
Sites Believed Eligible for Nomination to the National Register of Historic Places.....	129
Recommendations for Sites of Undetermined Eligibility.....	131
Impacts to Sites.....	131
Utility of Predictive Models.....	138
REFERENCES CITED.....	140

LIST OF FIGURES

Figure		Page
1.1	Map showing the general location of the project area.....	2
4.1	Taxonomic schemes which have been proposed for the Plains...	31
4.2	Proposed taxonomic scheme for cultural manifestations encountered during the 1983 Lake Oahe survey.....	32
6.1	Area of vandalism at 32EM1.....	57
6.2	Diagnostic artifacts from 32EM357.....	58
6.3	Log building at 32EM363.....	60
6.4	Diagnostic artifacts from IF LTA1383-10 and 32EM101.....	62
6.5	Diagnostic artifacts from 32EM354 and IF LTA1383-11.....	65
6.6	Wooden barn at 32EM122.....	67
6.7	Diagnostic artifacts from 32EM112.....	73
6.8	Diagnostic artifacts from 32EM30.....	80
6.9	Barn at 32EM90.....	88
6.10	Diagnostic artifacts from 32EM80 and 32EM79.....	91
6.11	Mound feature at 32EM78.....	97
6.12	Exposed cache pit at the Holbrook site, 32BL5.....	101
7.1	Examples of Aspect calculations.....	110
7.2	Distance to Missouri River variable.....	112
7.3	Distance to closest tributary variable.....	113
7.4	Distance to second closest tributary variable.....	114
7.5	Sinuosity Index of the Missouri River variable.....	115
7.6	Maximum slope variable.....	116
7.7	Aspect variable.....	117
7.8	Area of tree cover variable.....	118
7.9	Area of brush cover variable.....	119
7.10	Distance to timber variable.....	120
8.1	Slump block at 32EM81.....	136
8.2	Map of the Havens site, 32EM1.....	137

LIST OF TABLES

Table	Page
1.1 List of sections, portion of which were subject to 100 percent inventory during the 1983 Lake Oahe survey....	3
1.2 Areas sampled.....	6
4.1 Excavated sites in the vicinity of the Project Area.....	34
6.1 Cross reference chart for sites and isolated finds described in Chapter Six.....	51
7.1 Summary statistics for environmental variables.....	111
7.2 Results of nearest discriminant analysis procedure.....	122
8.1 Cultural components recognized within the sites recorded...	127
8.2 Recommendations for further work to assess National Register eligibility.....	132
8.3 Impacts to sites.....	135

CHAPTER ONE INTRODUCTION

During the summer and autumn of 1983, Larson-Tibesar Associates of Laramie, Wyoming, conducted an intensive cultural resource inventory of approximately 8200 acres (3320 hectares) of federal land along the left (east) bank of Lake Oahe within Burleigh and Emmons counties, North Dakota. The area inventoried extends from just south of Bismarck, North Dakota to the North Dakota-South Dakota state line. This work was conducted for the United States Army, Omaha District Corps of Engineers (Contract #DACP45-83-C-0243).

Crew members for the 1983 Lake Oahe project included Thomas Larson (principal investigator), Keith Dueholm, Ted Krieg, John Benko, Michael McFaul, Linda Coker and Ned Hanenberger. Historic sites and isolated finds were also inspected by Kurt Schweigert, Leslie Perry and Patricia Jessen of Cultural Research and Management, Bismarck, North Dakota. The archeological field inventory was begun on August 15 and completed on October 4, 1983.

Detailed maps which show all areas inventoried and the cultural properties recorded are presented in Appendix A within Volume II of this report. The contract called for a 100 percent inventory of most of the study area. In the northern portions, however, where large amounts of periodically flooded bottom lands are present, only a 25 percent sample inventory was requested (see Figure 1.1 and "Sampled Areas," below). Table 1.1 is a listing of the legal locations, down to the section level, of all areas subjected to a 100 percent inventory. Unless some of the section has been previously inventoried for proposed recreation areas (Larson et al. 1983), it can be assumed that all upper terrace areas (i.e., those areas not subjected to a 25 percent sampling) controlled by the Omaha District Corps of Engineers were inventoried.

In addition to the main body of this report, Volume II of the report contains five appendixes which supply more detailed information on the inventory and its findings. As already stated, Appendix A is a set of maps showing the boundaries of the area inventoried and the locations of the cultural resources recorded. Appendix B is a summary of the results of the documents searches conducted prior to the initiation of the field inventory. Appendix C is a tabular listing of management data related to each locality recorded. Appendix D lists and briefly describes all cultural materials collected during the 1983 inventory. Appendix E is a tabular listing of the environmental data utilized for the Analysis Chapter.

Finally, Volume III and Volume IV of the report contain copies of all site and isolated find forms completed for this project. Those readers interested in obtaining copies of Volumes II through IV, which have limited

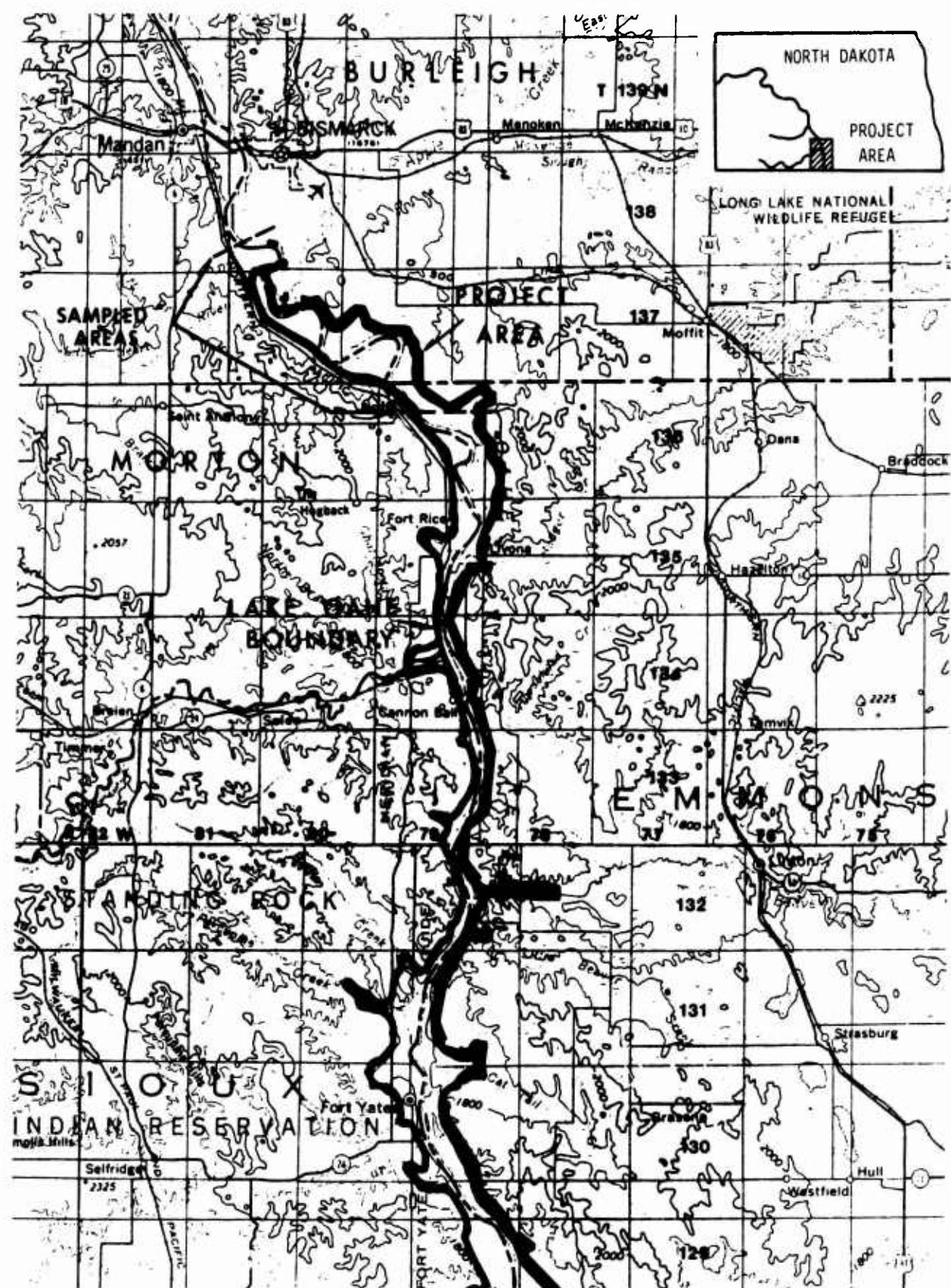


Figure 1.1 Map showing the general location of the project area. Adapted from U.S.G.S., State of North Dakota map; scale = 1:500,000.

Table 1.1. List of sections, portions of which were subjected to 100 percent inventory during the 1983 Lake Oahe survey.

TOWNSHIP	RANGE	SECTION	COUNTY	TOPOGRAPHIC MAP	
129	NORTH	78 WEST	19	EMMONS	MAHTO NE/POLLOCK NW
129	NORTH	78 WEST	29	EMMONS	POLLOCK NW
129	NORTH	78 WEST	30	EMMONS	POLLOCK NW
129	NORTH	78 WEST	32	EMMONS	POLLOCK NW
129	NORTH	78 WEST	33	EMMONS	POLLOCK NW
129	NORTH	79 WEST	3	EMMONS	FORT YATES SE
129	NCRTN	79 WEST	10	EMMONS	FORT YATES SE
129	NORTH	79 WEST	11	EMMONS	FORT YATES SE
129	NORTH	79 WEST	13	EMMONS	FORT YATES SE/MAHTO NE
129	NORTH	79 WEST	14	EMMONS	FORT YATES SE/MAHTO NE
129	NORTH	79 WEST	24	EMMONS	MAHTO NE
130	NORTH	79 WEST	3	EMMONS	FORT YATES SE
130	NORTH	79 WEST	4	EMMONS	FORT YATES SE
130	NORTH	79 WEST	8	EMMONS	FORT YATES SE
130	NORTH	79 WEST	17	EMMONS	FORT YATES SE
130	NORTH	79 WEST	20	EMMONS	FORT YATES SE
130	NORTH	79 WEST	21	EMMONS	FORT YATES SE
130	NORTH	79 WEST	28	EMMONS	FORT YATES SE
130	NORTH	79 WEST	33	EMMONS	FORT YATES SE
130	NORTH	79 WEST	34	EMMONS	FORT YATES SE
131	NORTH	79 WEST	4	EMMONS	FORT YATES NE
131	NORTH	79 WEST	8	EMMONS	FORT YATES NE
131	NORTH	79 WEST	17	EMMONS	FORT YATES NE
131	NORTH	79 WEST	20	EMMONS	FORT YATES NE
131	NORTH	79 WEST	29	EMMONS	FORT YATES NE
131	NORTH	79 WEST	32	EMMONS	FORT YATES NE/FORT YATES SE
132	NORTH	78 WEST	15	EMMONS	HAZELTON SW/GRASSNA NW
132	NORTH	78 WEST	16	EMMONS	GRASSNA NW
132	NORTH	78 WEST	17	EMMONS	HAZELTON SW/GRASSNA NW
132	NORTH	78 WEST	18	EMMONS	GRASSNA NW/FORT YATES NE
132	NORTH	78 WEST	18	EMMONS	HAZELTON SW/GRASSNA NW
132	NORTH	78 WEST	19	EMMONS	GRASSNA NW
132	NORTH	78 WEST	20	EMMONS	GRASSNA NW
132	NORTH	78 WEST	21	EMMONS	GRASSNA NW
132	NORTH	78 WEST	22	EMMONS	GRASSNA NW
132	NORTH	79 WEST	3	EMMONS	CANNON BALL SE
132	NORTH	79 WEST	4	EMMONS	CANNON BALL SE
132	NORTH	79 WEST	9	EMMONS	CANNON BALL SE
132	NORTH	79 WEST	10	EMMONS	CANNON BALL SE
132	NORTH	79 WEST	13	EMMONS	FORT YATES NE
132	NORTH	79 WEST	15	EMMONS	CANNON BALL SE/FORT YATES NE
132	NORTH	79 WEST	24	EMMONS	FORT YATES NE
132	NORTH	79 WEST	33	EMMONS	FORT YATES NE
132	NORTH	79 WEST	34	EMMONS	FORT YATES NE
132	NORTH	79 WEST	35	EMMONS	FORT YATES NE
133	NORTH	78 WEST	6	EMMONS	CANNON BALL SE
133	NORTH	78 WEST	7	EMMONS	CANNON BALL SE
133	NORTH	78 WEST	8	EMMONS	CANNON BALL SE
133	NORTH	78 WEST	18	EMMONS	CANNON BALL SE
133	NORTH	78 WEST	19	EMMONS	CANNON BALL SE

Table 1.1 (Continued). List of sections, portions of which were subjected to 100 percent inventory during the 1983 Lake Oahe survey.

TOWNSHIP	RANGE	SECTION	COUNTY	TOPOGRAPHIC MAP
133	NORTH	78 WEST	30	EMMONS
133	NORTH	79 WEST	25	EMMONS
133	NORTH	79 WEST	36	EMMONS
134	NORTH	78 WEST	31	EMMONS
134	NORTH	79 WEST	2	EMMONS
134	NORTH	79 WEST	11	EMMONS
134	NORTH	79 WEST	13	EMMONS
134	NORTH	79 WEST	14	EMMONS
134	NORTH	79 WEST	24	EMMONS
134	NORTH	79 WEST	25	EMMONS
134	NORTH	79 WEST	36	EMMONS
135	NORTH	78 WEST	6	EMMONS
135	NORTH	78 WEST	7	EMMONS
135	NORTH	78 WEST	19	EMMONS
135	NORTH	79 WEST	13	EMMONS
135	NORTH	79 WEST	23	EMMONS
135	NORTH	79 WEST	24	EMMONS
135	NORTH	79 WEST	26	EMMONS
135	NORTH	79 WEST	35	EMMONS
136	NORTH	78 WEST	18	EMMONS
136	NORTH	78 WEST	19	EMMONS
136	NORTH	78 WEST	30	EMMONS
136	NORTH	78 WEST	31	EMMONS
136	NORTH	79 WEST	1	EMMONS
136	NORTH	79 WEST	2	EMMONS
136	NORTH	79 WEST	3	EMMONS
136	NORTH	79 WEST	12	EMMONS
136	NORTH	79 WEST	13	EMMONS
137	NORTH	79 WEST	8	BURLEIGH
137	NORTH	79 WEST	14	BURLEIGH
137	NORTH	79 WEST	15	BURLEIGH
137	NORTH	79 WEST	16	BURLEIGH
137	NORTH	79 WEST	17	BURLEIGH
137	NORTH	79 WEST	18	BURLEIGH
137	NORTH	79 WEST	23	BURLEIGH
137	NORTH	79 WEST	26	BURLEIGH
137	NORTH	79 WEST	35	BURLEIGH
137	NORTH	79 WEST	36	BURLEIGH
137	NORTH	80 WEST	11	BURLEIGH
137	NORTH	80 WEST	13	BURLEIGH
137	NORTH	80 WEST	14	BURLEIGH
				SCHMIDT/SUGARLOAF BUTTE
				SUGARLOAF BUTTE
				SUGARLOAF BUTTE

distribution, should contact the staff archeologists at the Omaha District Corps of Engineers for further information.

In addition to the information contained in volumes I, II, III, and IV, the Corps of Engineers has also been supplied with U.S.G.S. topographic maps, aerial photos, land plat maps, and boating and recreation maps, all showing both the areas inventoried and the cultural properties recorded. Copies of the site forms for this project and all artifacts collected have been delivered to the State Historical Society of North Dakota, North Dakota Heritage Center, Bismarck, North Dakota.

The work performed under DACW45-83-C-0243 is intended to provide compliance with all, or pertinent segments of, the following list of federal and state documents:

1. Antiquities Act of 1906 and implementing regulations 43CFR Part 3.
2. The Reservoir Salvage Act of 1960.
3. The National Historic Preservation Act of 1966 and implementing regulations 36CFR Part 800.
4. National Environmental Policy Act of 1969.
5. Executive Order 11593.
6. Historic and Archeological Preservation Act of 1974.
7. The American Indian Religious Freedom Act.
8. Archaeological Resources Protection Act of 1979 and implementing regulations 36CFR Part 1215.
9. North Dakota Guidelines for Cultural Resource Inventory Projects.

Sampled Areas

As already noted, the contract called for only a 25 percent sample of certain areas of bottom land in the northern end of the survey area. A combined use of judgmental and stratified random sampling was utilized for these sampled areas. Table 1.2 describes the areas from which the sample was drawn and lists the specific areas within them which were inventoried.

Based on Larson-Tibesar Associates' previous work in the upper Lake Oahe region, it was obvious that many of the areas outlined in the 25 percent sample area should, in fact, be considered inundated during most of the year. For the purposes of this project, the most important of these inundated areas are all in the Carlson Bottom and nearly one-third of MacLean Bottom. Eliminating these areas from the sampling universe left approximately 9000 acres from which to draw the sample.

While the vast majority of the area outlined for 25 percent sampling is bottom land, there are small areas of upper terrace comprising approximately 485 acres. These areas were subjected to a 100 percent inventory due to

Table 1.2. Areas sampled.

General Sibley Campground

Location: Federal land on the left bank of the Missouri River within Section 28, Township 138 North, Range 80 West (Burleigh County).

Inventory Areas: 100 percent inventory (approximately 170 acres).

East Sibley

Location: Federal land on the left bank of the Missouri River within Sections 34 and 35, Township 138 North, Range 80 West and Sections 3 and 4, Township 137 North, Range 80 West (Burleigh County).

Inventory Areas: 100 percent inventory (approximately 126 acres).

Apple Creek

Location: Federal land on the left bank of the Missouri River within Sections 9, 10, 11, 15 and 16, Township 137 North, Range 80 West (Burleigh County).

Inventory Areas: N $\frac{1}{2}$ of the SE $\frac{1}{4}$ Section 9 and W $\frac{1}{2}$ of the SW $\frac{1}{4}$ Section 10 (160 acres).

Kimball Bottom

Location: Federal land on the left bank of the Missouri River within Sections 13, 14, 23, 24, 25 and 26, Township 137 North, Range 80 West and Sections 16, 17, 18, 19 and 20, Township 137 North, Range 79 West (Burleigh County).

Inventory Areas: N $\frac{1}{2}$ of the SW $\frac{1}{4}$ Section 13, E $\frac{1}{2}$ of the NE $\frac{1}{4}$ of the SE $\frac{1}{4}$ Section 14, E $\frac{1}{2}$ of the SE $\frac{1}{4}$ Section 23, E $\frac{1}{2}$ of the NW $\frac{1}{4}$ Section 24, N $\frac{1}{2}$ of the NW $\frac{1}{4}$ and N $\frac{1}{2}$ of the NE $\frac{1}{4}$ Section 25 (all T. 137 N., R. 80 W.), and E $\frac{1}{2}$ of the NW $\frac{1}{4}$ Section 19, T. 137 N., R. 79 W. (480 acres).

MacLean Bottom

Location: Federal land on the left bank of the Missouri River within Sections 14, 15, 22, 23, 26, 27, 28, 33, 34, 35 and 36, Township 137 North, Range 79 West (Burleigh County) and Sections 1, 2, 3, 4, 5, 6, 9, 10 and 11, Township 136 North, Range 79 West (Emmons County).

Inventory Areas: E $\frac{1}{2}$ of the NE $\frac{1}{4}$ Section 22, W $\frac{1}{2}$ of the NW $\frac{1}{4}$ and W $\frac{1}{2}$ of the SW $\frac{1}{4}$ Section 26, E $\frac{1}{2}$ of the SW $\frac{1}{4}$ and W $\frac{1}{2}$ of the SE $\frac{1}{4}$ Section 34, W $\frac{1}{2}$ of the SW $\frac{1}{4}$ Section 35, E $\frac{1}{2}$ of the NW $\frac{1}{4}$ Section 4, E $\frac{1}{2}$ of the NE $\frac{1}{4}$ Section 10, W $\frac{1}{2}$ of the NE $\frac{1}{4}$ Section 11, three-quarters of a mile of trail in the south half of Section 15, one mile of trail between Sections 26 and 35, one mile of trail between Sections 3 and 4, and one-half of a mile of trail between Sections 9 and 10 (756 acres).

the number of known sites along this upper terrace.

The Sibley Park and the East Sibley areas were also subjected to a 100 percent inventory. This was done because sampling of such already small areas was not believed to be cost or time effective. Additionally, the heavy use of Sibley Park and East Sibley seemed to argue for complete inventory.

An additional 40 acres of judgmental sample were reserved to investigate road cuts and other areas where buried cultural materials may have become exposed and visible. It is estimated that the areas of judgmental sampling (i.e., upper terrace areas, Sibley Park, East Sibley, and road cuts) make up approximately 875 acres, or .39 of the 25 percent sample.

The remainder of the sample was carried out as a stratified random sample using 80 acre, rectangular quadrats (one-quarter by one-half mile) as the sample units. Stratification was on the basis of the remaining three areas of bottom land - Apple Creek, Kimball Bottom and MacLean Bottom. All three of these areas were inventoried at the same relative intensity. This resulted in the surveying of two quadrats in Apple Creek Bottom, six quadrats in Kimball Bottom and nine quadrats in MacLean Bottom, for a total of 1360 acres of stratified random sample.

Documents Search

The two most critical goals in the initial stages of the documents search were to ascertain the number of previously recorded sites in the project area and, as closely as possible, the location of each of these cultural resources. The first step was to compare the descriptions and legal locations as they are provided in the original documentation on the site (e.g., Smithsonian Institution, River Basin Survey site forms, Will and Hecker 1944, etc.) and compare these materials against written and graphic syntheses (e.g., Cooper 1953; Jensen 1965; Adamczyk 1975; Corps of Engineers and Smithsonian Institution map files; etc.). Such preliminary research has been found to be very useful in resolving problems such as misplaced site locations, duplicated site numbers and incorrect descriptions of site type.

Data sources consulted for prehistoric sites include both published and unpublished materials as well as informant data. Key published materials were the listings and updates of the National Register of Historic Places, reports of the Smithsonian Institution, State Historical Society of North Dakota and the University of North Dakota. Unpublished reports, manuscripts, notes and maps were compiled from the Omaha District, Corps of Engineers Office, the National Park Service, Midwest Archeological Center in Lincoln, Nebraska, and the State Historical Society of North Dakota, Bismarck. A key informant concerning known site locations was Mr. Ralph Thompson, of Bismarck, a highly knowledgeable amateur very familiar with the upper Lake Oahe area.

Prior to commencement of the field inventory a list of possible historic period sites within the vicinity of study area was generated by Kurt P. Schweigert, Project Historian, Cultural Research and Management.

These data were then supplied to the archeological survey team. The list of potential and known historic sites, which is contained as part of Appendix B of this report, was generated from available survey plats, atlases of Emmons and Burleigh counties, and the site files of the State Historical Society of North Dakota. Other historical collections and materials about Burleigh and Emmons counties were also consulted in the collections of the State Historical Society. Information about pre-patent entries and locations of early homesteads, ranches, trails, post offices, and ferries was sought in General Land Office Plats and notes of surveyors which are maintained by the North Dakota State Water Commission in Bismarck.

The prehistoric and preliminary historic documents searches were followed by the construction of a map file which pinpointed, as closely as possible, the locations of previously recorded cultural resources. The maps, together with copies of all previously recorded site forms, published material and manuscripts were then taken into the field in an effort to relocate these resources.

Appendix B lists all cultural resources indicated to exist within any segment of the sections crossed by the 1983 survey. Many of the properties listed are outside of the actual inventory area. The appendix contains 231 entries. Of these, 75 are believed to be inundated by the waters of Lake Oahe. Another 62 are not inundated but are outside of the area inventoried. Twenty of the locations are so vague as to be of little use. Another five locations are believed to be either outside the survey area or inundated, but they are in some way related to sites which were recorded in 1983.

Of the remaining 69 possible site locations, 22 were located and 47 were not. The 22 located properties are discussed along with the newly recorded cultural resources in Chapter Six. Many of the 47 not found are probably inundated or outside the survey area, but there is no way of telling this from the documents examined.

The data gathered from the files at the State Historical Society of North Dakota originate from sources of greatly varying quality and detail. Some of the information was gathered from informant questionnaires circulated in the 1930's. Many of the sites mentioned in those questionnaires are no doubt the same locations recorded later in greater detail by Will and Hecker (1944) and the Smithsonian Institution.

Previous Cultural Resource Work in the Area

A great deal of previous historic and archeological work has been conducted by both amateurs and professionals in and near the study area. Most of these studies are discussed by Wood (1983) in a previous summary of the Upper Lake Oahe area. A number of the investigations believed to be most important to the present study are listed below, in roughly chronological order. Only those studies and projects which contain mention of sites between Bismarck and the North Dakota-South Dakota state line have been included in the following discussion.

1896 - J.V. Brower of the Minnesota Historical Society gathers prehistoric artifacts in the vicinity of Bismarck believed to be ancestral to the Mandan (Brower 1904).

1904-1905 - George F. Will and Herbert J. Spinden gather data on prehistoric "Mandan" culture, particularly from excavations of the Double Ditch site near Bismarck (Will and Spinden 1906).

1907 - Ernst R. Steinbrueck compiles two regional maps showing the locations of many of the earth lodge villages along the Missouri River in North Dakota (Wood 1978).

1908 - A.B. Stout and Ernst R. Steinbrueck make a detailed map of the Shermer site (32EM10) for the State Historical Society of North Dakota (see Sperry 1968:5).

1911 - George F. Will and Herbert J. Spinden compile information on sites along the Missouri River in North Dakota and South Dakota (Will 1924).

1930's-1940's - Thad Hecker, with the State Historical Society of North Dakota, excavates and tests a number of sites along the Missouri River and compiles a listing of the known village sites in the region. This monograph was subsequently published under the authorship of Will and Hecker (1944). As Wood (1983:99) notes this publication "also contained the first taxonomy of village sites in the area: Archaic Mandan (principally now including Extended Middle Missouri variant sites); Middle Mandan (which includes the Huff phase of the Terminal variant of the Middle Missouri); Later Heart River (basically the present Post-Contact Coalescent Heart River phase sites); Decadent (including many of the post-1780 village sites of the Coalescent tradition); and Cheyenne and Arikara Villages (Will and Hecker 1944)."

1929-1931 - Alfred W. Bowers conducts field work which ultimately results in a second proposed taxonomy (Bowers 1948) for archeological components along the Missouri River in North Dakota and South Dakota. Within the present study area, Bowers' groupings included "the Cannonball focus (roughly equivalent to the Fort Yates phase); the Huff focus (basically the Huff phase); and the Heart River focus (now the Heart River phase)" (Wood 1983:100).

1938 - William Duncan Strong excavates at On-a-Slant Village at the mouth of the Heart River. This material was analyzed by Carlyle S. Smith and became incorporated into Strong's (1940) synthesis of the archeology of the Northern Great Plains.

1946 - The Missouri River Basin Survey is organized to conduct archeological and paleontological investigations related to Federal watershed projects along the Missouri River. Although the River Basin Survey was formed as an arm of the Smithsonian Institution, Bureau of American Ethnology, data recovery was actually an inter-agency cooperative effort also involving the National Park Service, the Bureau of Reclamation, and the United States Army Corps of Engineers (Roberts 1953). Valuable cooperation was also provided by non-federal agencies and institutions. Primary among these within the study area were the State Historical Society of North Dakota and the University of North Dakota.

1947-1952 - River Basin Survey teams gather field information and complete the first forms on sites along the Missouri River in North Dakota (Cooper 1953; Jensen 1965). Key personnel involved in this effort include Paul L. Cooper, J.J. Bauxar, George Metcalf, R.C. Farrell and J.J. Hoffman.

1946-1969 - Testing and major salvage excavations take place at archeological sites which will be impacted by the waters of Lake Oahe. Within North Dakota, work was conducted at the Huff site (32M011; Wood 1967), the Paul Brave site (32SI4; Wood and Woolworth 1964), the Robert Zahn site (32SI3; Wood and Woolworth 1964), the Battle-Porcupine Creek area sites (32SI6, 32SI7, 32SI8, 32SI76, and 32SI77; Scheans 1957), Boundary Mounds (32SI1; Wood 1960), the Tony Glas site (32EM3; Howard 1958), the Schmidt Mound site (32M020; Neuman 1975), mound site 32M0207 (Neuman 1961), the Shermer site (32EM10; Sperry 1968), the Fire Heart Creek site (32SI2; Lehmer 1966), Alkire Mound (32SI200; Henning 1965), the Havens site (32EM1; Sperry 1982) and the Bendish site (32M02; Thiessen 1976). Of the above mentioned sites, Shermer and Havens are within the 1983 survey area and Tony Glas is immediately adjacent to it.

1953 - Ray H. Mattison (1953) completes a monograph on the known historic sites in the vicinity of Oahe Reservoir.

1954 - Donald J. Lehmer (1954) presents the first version of his cultural chronology for the village peoples of the Northern Plains.

1961 - Waldo R. Wedel (1961) publishes a fairly detailed synthesis of the known prehistoric archeology of the Great Plains. Wedel's chapter on the Middle Missouri subarea contains a discussion of much of the excavation work completed along the river in the 1950's.

1971 - Lehmer's (1971) Middle Missouri Archeology is published. Although several changes have been proposed to cultural taxonomic scheme presented by Lehmer, this book remains the primary guide to the known prehistoric cultures of the Middle Missouri subarea.

1970's-1980's - The Army Corps of Engineers initiates in-house and contract funded cultural resource inventories of Lake Oahe.

1979 - The University of North Dakota conducts limited test excavations at On-a-Slant Village (32M026; Ahler, Schneider and Lee 1981).

1980 - The University of North Dakota conducts inventory and site testing in the path of Northern Border Pipeline (Root and Gregg 1983a; 1983b). This pipeline passes through the 1983 Lake Oahe survey area and impacted sites 32EM19 and 32EM21 (see Chapter Six).

Field Inventory Techniques

The total project area was inventoried by six persons operating as either two person or three-person crews. While three-person crews were utilized most often, many of the areas inspected are too narrow to efficiently use three people. In these instances, two-person crews were utilized. The basic survey methodology employed by Larson-Tibesar

Associates utilized a series of parallel survey transects with crew members spaced approximately 30 meters apart.

Cultural material observed during the inventory phase of the project was identified and recorded as either a site or an isolated find. The distinction between site and isolated find is based on the density of surface materials, potential for buried cultural materials and the presence of cultural features. A locality was always recorded as a site if cultural features or buried cultural deposits were present. An area was also recorded as a site if the density of surface materials reached a prescribed level; in most cases, all cultural items considered part of the same site had to be within 30 meters of one or more other items from the site. Some exceptions were taken to this maximum spacing if it appeared that buried cultural deposits were likely present in between the items. Additionally, if artifacts were found farther than 30 meters away, but appeared to have been removed from main site area by erosional processes, then these were also recorded as part of the site. All other cultural materials were recorded as isolated finds.

At prehistoric sites, the minimal documentation procedures were as follows:

- 1) Intensive examination of the area by the entire crew using "mini-transect" coverage (i.e., spacing of approximately one-two meters).
- 2) At all sites, the location of all cultural features, diagnostic artifacts and concentrations of artifactual materials were marked with pin flags.
- 3) Site boundaries, observed features and any collected cultural materials were mapped using a portable transit and stadia rod.
- 4) A datum marker, corresponding to the site mapping station, was left at each recorded site. Where possible, the location of this datum was tied into surrounding topographic features and Corps boundary markers.
- 5) All sites were photographed and appropriate State of North Dakota cultural site survey forms completed. The location of all sites was plotted on field maps and available aerial photos and then transferred to clean copies for inclusion on site forms and on-going project area maps.

Collection of cultural materials was restricted to those items believed to be temporally or culturally diagnostic and whose collection would be useful to the overall goals of this project. All collected materials are stored at the State Historical Society of North Dakota. The locations of all collected items were mapped prior to collection to provide minimal loss of contextual information.

Artifact Analysis

As previously stated, only those items believed to be temporally or culturally diagnostic or useful to the overall goals of this project were collected. A list of those items collected is presented as Appendix D within Volume II of this report.

Observed but non-collected artifactual materials was analyzed in the field. Analysis of both collected and non-collected prehistoric artifacts is based on a set of standardized attributes. For lithics these included raw material type, artifact type, completeness and size grade. Raw material type was defined using regionally accepted terminologies (e.g. Schneider 1972; Clayton et al. 1970). Stage of decortication, a part of the completeness attribute, follows Schneider (1972).

Size grades are as follows:

Size Grade

1	less than one-quarter inch (.635 cm)
2	greater than or equal to one-quarter inch but less one-half inch (1.27 cm)
3	greater than or equal to one-half inch but less than one inch (2.54 cm)
4	greater than or equal to one inch but less than two inches (5.08 cm)
5	greater than or equal to two inches but less than three inches (7.62 cm).
6	greater than or equal to three inches

The widest dimension on the artifact determines the size grade.

Ceramic descriptions generally follow Sperry (1968), Sperry (1982), Ahler (1977), Wood (1967), Woolworth and Wood (1964) and Neuman (1975). Only rim sherd and body sherd containing distinctive decorative elements were collected. Uncollected body sherd were size graded in a manner similar to lithic debitage (see above).

Historic Field Methods, Description, and Evaluation Procedures

Investigation of historic period cultural resources was conducted by Cultural Research & Management, Inc., under subcontract with Larson-Tibesar Associates. Field inspection of these resources was accomplished by Kurt P. Schweigert, Historian/Architectural Historian, Leslie Perry, Historical Archeologist, and Patricia Jessen, Research Assistant. Deed research, biographical research, and site form preparation were conducted by Pat Jessen and Kurt Schweigert. Site discussions, site evaluations and amendments of the historical overview for the present report were prepared by Kurt Schweigert.

Field survey and recording activities of the historical team were directed to those localities and sites at which the archeological survey team had discovered apparent historic period cultural remains. Field

inspection of historic period resources on the east bank of Lake Oahe was conducted in late October and early November, 1983, when weather conditions and vegetation were ideal for field examination.

Field recording included creation of extensive tape-recorded notes describing the physical nature and setting of each site, the nature and location of artifacts, and the dimensions, composition and contents of structural features. A map was prepared to illustrate the locations and orientations of all site features. The map was prepared by means of pacing along compass bearings between features. All bearings were paced by Kurt Schweigert in order to maintain consistency in the relative measurements. Very limited artifact collection took place during the recording of historic period sites because the observed artifacts were not particularly diagnostic of ethnic associations or the demographic character of former site occupants, and because the age and function of most of the sites was evident in the features and/or general artifact assemblages on the sites. Samples of window glass were collected from some sites for use in studies of relative thickness and chemical coloration of window glass from different time periods and different geographical zones.

Recording of standing structures or remains of buildings included description of identifiable or probable dimensions, structural systems, roof shapes, principal materials and the nature of any foundation or basement, exterior wall treatments, fenestration and entries, and ornamentation. A plan sketch was drawn for each standing structure including the measured dimensions and a compass bearing for the main entrance or facade. Apparent alterations, additions, or erosions of original structures were verbally noted. Black and white print photographs were taken of each feature and concentrations of artifacts. Whenever possible, photographs were taken from opposing corners of buildings in order to represent all exterior elevations, roof slopes, and ornamental treatments.

Features other than standing structures were verbally described as to nature (depression, artifact concentration, etc.), dimensions including depth, and contents if any. Non-structural features were usually photographed from one angle, except when the feature could not be adequately represented in one photograph. Information recorded in written notes and photographs overlapped considerably with recorded field notes, to provide a back-up of field information should one or the other source of information be damaged or lost.

Following field survey, the recorded notes were transcribed onto magnetic computer disks in a site form format approved by the State Historic Preservation Office in North Dakota. Site sketch maps and building plan maps were transferred to the appropriate site forms, and photographs were attached to the site forms.

Histories of surface ownership of the recorded sites were developed through consultation of deed records in Burleigh and Emmons counties. Some deed record books are missing from the Emmons County Register of Deeds office, however, and therefore title histories could not be developed for some sites. This information may exist in Corps of Engineers land procurement files, or could possibly be generated at additional cost from records of title abstractors in Emmons County. Names of persons formerly associated with the sites were sought in the general biographical works

about North Dakota, in historical publications about the two counties, and in records of the Historical Data Project which are included in the papers of the Works Progress Administration now maintained by the State Historical Society of North Dakota. Published works consulted include Ogle (1912, 1916), Hixson (1916), Hennessy (1910), Lounsberry (1917), Crawford (1931), Robinson (1966), Bird and Taylor (1972), Woods and Wenzel (1976), and Bauman and Jackson (1978).

Architectural evaluations of standing structures and remains of structures included categorization according to accepted architectural styles or periods, and determination of the relative values of the buildings in the architectural history of the region, state and nation. Evaluation of the relative rarity and/or representative values of the buildings was conducted with reference to Historical Architectural Overview of Western North Dakota (Schweigert 1983a), which is the only available synthesis of rural architecture for the region. All sites were evaluated according to the following questions:

- 1) Does the site exhibit outstanding physical characteristics, such as architecture or site organization and construction?
- 2) Does the site exhibit a likelihood to contain artifactual or architectural remains which could significantly expand existing knowledge about historic human activities in the region? The field of historical archeological investigation of settlement sites is not yet well developed, and therefore there are few parameters or guidelines for determining the potential value or National Register eligibility of the archeological component of settlement sites. The general standards applied in this study were: the extent of the site; the apparent representation of dwelling and economic function areas such as barns, root cellars, workshops and corrals; and the nature, abundance and apparent temporal range of domestic and other artifacts on the site.
- 3) Does the site represent a site type particularly well? A site type might include such specific categories as a particular method of construction associated with an ethnic group, or broad categories such as initial homesteads of the region.
- 4) Does the site have possible historical significance apart from the physical nature of the site? Such significance might arise from association of the site with persons important in history, or from the occurrence of an important historical event at that location.
- 5) Does the site retain essential integrity in the features and areas which may have scientific/cultural or historical socio-cultural importance?

CHAPTER TWO ENVIRONMENTAL SETTING

The project area consists of the east bank of the Missouri River, from General Sibley campground, located four miles south of Bismarck, to the South Dakota state line. The area is characterized by long, narrow strips of uplands and, in the northern segment, portions of floodplain not inundated by the impoundment of Lake Oahe. While the lowlands are usually wooded and the uplands are primarily mixed-grass prairie, topography and other factors allow a wide variety of habitats to exist within, or adjacent to, the project area. Although all areas inventoried are within land administered by the Corps of Engineers, it is desirable to characterize the habitats adjoining these lands as well. Thus, the following environmental description (especially concerning vegetation) often includes situations which may not have been encountered within the survey area itself but which are known, or could reasonably be expected, to occur in the vicinity of the study area.

Physiography, Geology and Paleoclimate

The project area is part of the Missouri River Trench, a river valley cut into a part of the glaciated Missouri River section of the Great Plains province (Johnson et al. 1976). The trench is situated on basal Cretaceous formations (Fox Hills and Hell Creek). Overlaying these are Tertiary formations, such as Tullock, Ludlow, Cannonball and Tongue River which are exposed on steep, dissected valley slopes.

Pre-late Wisconsinan glaciations deposited a great deal of till over the eastern portions to the Missouri Plateau. The last of these was the Napolean glaciation which probably did not advance beyond the present location of the Missouri River in the study area (Moran et al. 1976:149). Following the deposition of the Napolean Drift there was a period of erosion and weathering during which the present valley bottoms were entrenched. Moran et al. (1976:150) consider this weathering episode to be middle Wisconsinan in age.

During the late Wisconsinan, the Lostwood glaciation covered areas to the north and east of the study area, with final advances of ice starting approximately 22,000 years before present (B.P.). Near the end of the Lostwood glaciation, meltwater flowed southward into the Missouri Valley depositing a gravel terrace approximately 10 meters above the present river level. These gravels were subsequently covered with a loess deposit. These deposits are referred to as Mallard Island and form the lowest member of what Clayton and Moran (1971) have named the Oahe formation.

From the end of glaciation to approximately 10,000 years B.P. there occurred a cool humid period during which time much of the area was covered

by spruce-aspen woodland. These conditions resulted in the development of a fine-grained and brightly-colored soil which makes up the lower portion of the Aggie Brown member of the Oahe formation (Moran et al. 1976:153). Between 10,000 and 8,500 years B.P., the climate warmed somewhat and the spruce-aspen woodland was replaced by grasslands. The resultant soils are the dark fine-grained portions of the upper Aggie Brown member (Moran et al. 1976:153). The formation of the Aggie Brown member is, chronologically, nearly analogous to the Paleoindian period of the cultural sequence for the Plains (e.g., Frison 1978).

Four terraces have been identified along the river valley (Johnson et al. 1976). The two lower levels are alluvial with alluvial and outwash deposits averaging 30 to 35 meters in depth. These terraces are often forested. Below this is glacial fill, presumably early Wisconsinan in age. These terraces of low relief are separated from the two upper terraces by steep, high slopes. The upland terraces are formed on bedrock and usually support grassland vegetation. Outlying patches of the Tongue River formation occur as isolated buttes in the uplands (Johnson et al. 1976). Generally, however, the terrace surfaces are flat to rolling.

Width of the present floodplain of the Missouri River ranges from less than 1.6 to more than 11.3 kilometers (Johnson et al. 1976) and is up to 100 meters deep. Prior to impoundment the river, particularly that stretch south of Bismarck, had a very rapid rate of meandering (Johnson et al. 1976). From the early 1880's to the early 1970's, the main channel is known to have moved laterally as much as 1.2 kilometers.

Climate

The portion of the Missouri Valley in which the study area is located is within the Upper Sonoran life zone (Bailey 1926). This zone is characterized by a semiarid climate in which evaporation exceeds precipitation most of the year. Mean annual precipitation ranges from 38 to 43 centimeters a year, with the rate of precipitation generally decreasing the farther south one goes (Kazeck 1956:87, 127).

This amount of precipitation would be insufficient for sustained agricultural development if it were not for the time of year it comes. As Wilkins and Wilkins (1977:16) point out:

The only meteorological stations in the United States to record a lower annual precipitation than North Dakota's are those in the desert of the Southwest and the Great Basin area of the Far West. The single factor which enables North Dakota to survive is that 77 percent of the annual moisture comes during the growing season - a greater percentage than that received in the same period in any other state.

North Dakota is infamous for its temperature extremes. The July temperature mean for the study area is 20 degrees Celsius while the mean January temperature is -21.7 degrees Celsius (Kazeck 1956:89; Jensen n.d.). Extremes for the state are a recorded low temperature of -51.1 degrees Celsius and a high of 49.4 degrees Celsius, both recorded during 1936 (Kazeck 1956:89).

Soils

Soils in this region of North Dakota are principally Borolls, which are characterized as frigid (average annual soil temperature of less than eight degrees Celsius) and have average moisture (Aandahl 1972). Two primarily upland associations of Great Groups have been mapped in the study area.

In Burleigh County a Haploborolls-Argiborolls-Ustipsammets association is present. This consists mainly of loamy and sandy soils on level to rolling topography (Aandahl 1972). The association consists of more than 60 percent Haploborolls (which are coarse-loamy and fine-loamy in texture), Argiborolls (which are fine-loamy and fine-silty in texture, occurring on level to undulating slopes, and usually have an argillic horizon) and shallow Ustipsammets (which are commonly sandy).

Loamy soils, formed in residuum from sandstones and shales on level to rolling topography are dominant in this association. Other sandy and clayey soils are also present. Soils formed in valley alluvium occupy only 12 to 16 percent of the map unit (Aandahl 1982).

To the south, in Emmons County, is an Ustorthents-Argiborolls association which is generally loamy and shallow and occurs on undulating to steep topography. This association is occupied by more than 30 percent loamy Ustorthents and Entic Haploborolls on hilly and steep slopes. These are often thin and are usually formed in glacial till or loess, both of which are thicker nearer the Missouri River, or in residuum from soft sandstones and shales. Although these dominate the landscape, they are not always the most extensive. Other principal soils occur on level to rolling slopes. These are thicker than the preceding, many have argillic horizons, and some are influenced by sodium. Soils formed in valley alluvium (disregarding reservoirs) along the Missouri River occupy eight to 16 percent of this map unit (Aandahl 1982).

Numerous soil series are present in the study area. Some which occur in both northern and southern associations include Vebar (sloping, coarse-loamy), Amor and Morton (sloping, loamy), Flasher (sloping, sandy shallow), Cabba (sloping, loamy shallow) and Belfield (sloping, loamy Glossic Natriborolls). Soil series represented only in the northern association include Reeder, Telfer, and Parshall (Aandahl 1982). Soil series present only in the south include Zahill, Zahl, Brandenburg and Werner (Aandahl 1982). Many of these have the potential to support similar native plant communities, dominated primarily by mid-grasses (Aandahl 1982).

Soils of the Missouri River floodplain are (or were) strongly influenced by the meandering river. The river's frequent floods have deposited as much as 1.8 meters of silt on parts of the floodplain. In general, sandier soils are present near the main channel and tend to support cottonwood forests. Silts and clays are usually further away from the river and tend to support forests of elm and ash. Due to the frequent flooding and silting of the floodplain in the past, the forest vegetation cover has had little chance to affect soil development (Johnson et al. 1976).

Four basin soil series are present in the uninundated floodplain between Garrison Dam and southern Burleigh County (Johnson et al. 1976).

These may well represent the pre-impoundment conditions in the vicinity of upper Lake Oahe. The four basin series are Banks, occupying five to 15 percent of the floodplain area; Havre, occupying 60 to 85 percent; Lohmiller, occupying five to 15 percent; and Gallatin, occupying less than five percent of the total floodplain area (Johnson et al. 1976).

Vegetation

The vegetation along the portion of the Missouri River inventoried has been broadly characterized as the Great Plains Short-grass Prairie province (Bailey 1926) the Bouteloua gracilis province (Daubenmire 1978) or Mixed grass Prairie (Whitman and Wali 1975). The uplands support, in a broad sense, wheatgrass-needle-grass (Agropyron-Stipa) grassland (Kuchler 1975; Bailey 1980). Northern floodplain forest (Populus-Salix-Ulmus) occurs along the Missouri River (Kuchler 1975) and certain elements of Tall-grass Prairie (i.e., the Andropogon scoparius province of Daubenmire (1978)), extend west along moist slopes and bottomlands of the Missouri River Valley. Within this overall setting various factors, such as topography, aspect, soil texture and moisture, allow a variety of plant communities to exist within, or near, the project area. Nomenclature in the following descriptions of plant communities generally follows that of the Great Plains Flora Association (1977).

Level to rolling surfaces of the upper terraces generally support a Mixed-grass Prairie community, the most extensive vegetational type occurring within the state of North Dakota (Whitman and Wali 1975). Grasses or sedges are dominant components of this community, especially the mid-grasses needle-and-thread (Stipa comata), western wheatgrass (Agropyron smithii), green needlegrass (Stipa virdula), Sandberg's bluegrass (Poa sandbergii) and junegrass (Koeleria pyramidalis and/or K. macrantha), beneath which are such short-grasses or sedges as blue gramma (Bouteloua gracilis), buffalo grass (Buchloe dactyloides, occasionally), threadleaf sedge (Carex filifolia) or sun sedge (C. heliophila). Variations in soil texture may affect the relative contributions of the constituent grasses. Western wheatgrass, for instance, may attain greater importance in fine-grained soils as may needle-and-thread in coarser-grained soils. In the latter instance sandreed (Calamovilfa longifolia) may also attain importance (Aandahl 1982).

Heavy grazing has tended to decrease the relative importance of mid-grasses while increasing that of short-grasses, especially blue gramma. Forb production in Mixed-grass Prairie is much less than grass production (Redmann 1975), yet a variety of species occur in this community (Hanson and Whitman 1938; Redmann 1975). Some are evident only early in the growing season, such as biscuitroot (Lomatium orientale) and Plains wild onion (Allium textile), while others such as coneflower (Echinacea angustifolia) and purple prairie clover (Petalostemon purpureum) are more evident in mid to late summer. Other frequent forbs include globe mallow (Sphaeralcea coccinea), white sage (Artemisia ludoviciana), white heath aster (Aster ericoides), blazing star (Liatris punctata), golden aster (Chrysopsis villosa), locoweed (Oxytropis lambertii), silver scurfpea (Psoralea argophylla), prairie turnip (P. esculenta), butterflyweed (Gaura coccinea), milkwort (Polygala alba) and toadflax (Commandra umbellata). The subshrub fringed sage (Artemisia frigida) may also be prevalent.

Infrequent buttes capped by the Tongue River formation occur near the project area. The slopes of these are usually highly eroded clays or silts, supporting a sparse vegetation cover and giving them a badlands appearance. This vegetation includes such grasses as western wheatgrass, blue gramma, saltgrass (Distichlis spicata) and foxtail barley (Huordeum jubatum). Forbs such as saltbush or silverscale (Atriplex spp.), goosefoot (Chenopodium spp.), povertyweed (Monolepis nuttalliana), seablite (Suaeda depressa) and wild buckwheat (Eriogonum pauciflorum), and the shrubs Tong-leaf sage (Artemisia longifolia) and rabbitbrush (Chrysothamnus nauseosus) occur on these eroded clay slopes and outwashes.

The western extensions of the Andropogon scoparius province of Daubenmire (1978) occurs on the steep slopes and drainage cuts of the upper terraces. This province often has a high proportion of Tall-grass Prairie species, as well as shorter members of the Mixed-grass Prairie. This Andropogon scoparius community contains such mid-grasses as needle-and-thread, side-oats gramma (Bouteloua curtipendula), and stonehills muhly (Muhlenbergia cuspidata) as well as such tall-grasses as little bluestem (Andropogon scoparius). Sandreed and sandhills bluestem (A. hallii) occurs in sandy areas. On lower slopes, big bluestem (A. gerardii) may reach heights in excess of 1.5 meters. Such forbs as stiff sunflower (Helianthus rigidus), wild lettuce (Lactuca pulchella), alumroot (Heuchera richardsonii), prairie smoke (Geum triflorum), prairie turnip, prairie clovers (Petalostemon spp.), ground plum (Astragalus crassicarpus), gaillardia (Gaillardia aristata), coneflower (Echinacea angustifolia), prairie coneflower (Ratibida columnifera), stiff goldenrod (Solidago rigidus) and many others are present. In situations where this community adjoins drainages or draws, bur oak (Quercus macrocarpa) may be present in various amounts, usually sparingly.

The introduction of leafy spurge (Euphorbia podperae and/or E. esula) has drastically decreased the diversity of the native grasslands in many areas. In one area of Mixed-grass Prairie examined, the only understory to this rhizomatous forb was depauperate specimens of threadleaf sedge, the various mid-grasses or other short-grasses having been eliminated. In this area, leafy spurge was also invading stands of big and little bluestem on the slope of a ravine. A marked decrease in height and vigor of these grasses and a decrease in the abundance of forbs was observed in areas where spurge had invaded. This will only make it increasingly difficult to find quality stands of native grasslands in the region.

Many of the deep, narrow ephemeral stream drainages cut through the bedrock terraces contain a Hardwood Draw community. This community also develops on the terrace slopes near the mouths of these drainages. It is often characterized by bur oak in open to relatively dense stands. Other deciduous trees which may be found in the community include green ash (Fraxinus pensylvanica), box elder (Acer negundo) and American elm (Ulmus americana). Infrequent trees include aspen (Populus tremuloides) and hackberry (Celtis occidentalis) (Johnson et al. 1976). These draws support stands of various shrubs including buffaloberry (Shepherdia argentea), currant (Ribes americanum and others), chokecherry (Prunus virginiana), plum (P. americana), buckbrush (Symphoricarpos occidentalis), juneberry (Amelanchier alnifolia) and Wood's rose (Rosa woodsii). Various mesophytic forbs, such as Canada violet (Viola canadensis) and false solomon's seal

(*Smilacina stellata*) can also be found within the stands of trees. Where the shrubs or trees are not particularly dense, such as on the slopes of these draws, grasslands of the *Andropogon scoparius* type are commonly present. Although this community is relatively small in aerial extent, it provides important travel corridors, cover and winter food for much of the big game that inhabits, or formerly inhabited, the prairie region (Whitman and Wali 1975). The concentrations of edible berries, the presence of wood, and game trails may well have made the draws attractive to aboriginal cultures as well as wildlife.

The two lower terraces along the Missouri River support a floodplain forest and a mosaic of other vegetational communities. In addition to forests, these include marshes, sand dunes and sandbars, and brushland (Johnson et al. 1976).

The Marsh community occurs in old channels of the Missouri River and its tributary streams. This community is usually dominated by cattails (*Typha* spp.). Various other emergent hydrophytes are also present including bulrush (*Scirpus* spp.), giant reed (*Phragmites australis*) and reed canarygrass (*Phalaris arundinacea*). Such forbs as water plantain (*Alisma* spp.) and arrowleaf (*Sagittaria* spp.) are found in shallows within the marshes. Marshes are much more frequent in the project area at the present time due to shallow flooding of the terraces by Lake Oahe.

On their dry sides, marshes merge into a Wet Meadow community, dominated by tall graminoids. Pre-eminent among these are sedges (*Carex* spp.), spikerushes (*Eleocharis* spp.), reedgrass (*Calamagrostis inexpansa*), manna-grass (*Glyceria* spp.), reed canarygrass, and prairie cordgrass (*Spartina pectinata*). These normally tall graminoides form a dense vegetative cover. Such forbs as iris (*Iris missouriensis*), giant goldenrod (*Solidago gigantea*), Jerusalem artichoke (*Helianthus tuberosus*, other species of *Helianthus*), field mint (*Mentha arvensis*), blue vervain (*Verbena hastata*) and dock (*Rumex* spp.) are normally present in this community. Where wet meadows have been heavily grazed many of the native grasses have been replaced by introduced grasses such as Kentucky bluegrass (*Poa pratensis*) and quackgrass (*Agropyron repens*) (Keammerer et al. 1975) or redtop (*Agrostis stolonifera*). Wet meadows also extend along tributary streams and the moist bottoms of Hardwood Draws in the upper terraces.

On the wet side of the marsh, generally where water is greater than six feet deep, emergent aquatics disappear and submerged aquatics such as pondweed (*Potamogeton* spp.), coontail (*Ceratophyllum demersum*) and horned pondweed (*Zannichellia palustris*) appear. Floating-leaved aquatics such as yellow water lily (*Nuphar luteum*) as well as various algae are also present. These species provide a loosely knit Lacustrine Community which is a valuable food source for migrating and resident waterfowl.

Active sand dunes and sandbars are found adjacent to the river channel. These are normally sparsely vegetated. The Sand Dune community contains scattered sedges or horsetails (*Equisetum* spp.) and is sometimes stabilized by saplings of cottonwood (*Populus deltoides*), various willows (especially *Salix interior*, *S. amygdaloidea*, *S. missouriensis* and *S. lutea*), sandreed, Indian ricegrass (*Oryzopsis hymenoides*) and lemon scurfpea (*Psoralea lanceolata*). Sandbars, although included within this community, also contain numerous semiaquatic plants such as bulrush and rush (*Juncus* spp.) in

addition to sedges (Johnson et al. 1976; Keammerer et al. 1975). Individual occurrences of this community are normally small, but may range up to 10 hectares in size (Johnson et al. 1976).

For the most part the lower alluvial terraces contain floodplain forests. Grazing in many of these areas has allowed a proliferation of shrubs such as Wood's rose and buckbrush, as well as the introduced shrub fly honeysuckle (Lonicera tatarica), creating a Brushland Grazing Disclimax community (Johnson et al. 1976).

The overstory of the floodplain forest, often called gallery forest, contains cottonwood, peachleaf willow (Salix amygdaloides), green ash, box elder, American elm and bur oak. Occasionally such shrubs as chokecherry, buffaloberry and Russian olive (Elaeagnus angustifolius, introduced) may reach tree size (Johnson et al. 1976). Other common shrubs or woody vines include red-osier dogwood (Cornus stolonifera), poison ivy (Rhus radicans, present as both shrubs and woody vines), juneberry, woodbine (Parthenocissus inserta), foxgrape (Vitis vulpina) and, occasionally, bittersweet (Celastrus scandens) and Virgin's bower (Clematis ligusticifolia) (Keammerer et al. 1975; Johnson et al. 1976).

The floodplain forest may be divided into two general communities; a Cottonwood Forest community and a Mesic Forest community. The Cottonwood Forest community generally occurs on sandy soil near the Missouri River or on the lower of the two alluvial terraces. Young cottonwood forests contain many small trees but few other woody species. Older cottonwood forests contain tall, widely spaced trees and numerous tall shrubs, saplings and herbs (Johnson et al. 1976). The shrubs include those listed above. Herbs include field mint, bergamot (Monarda fistulosa), vetch (Vicia americana) and wild licorice (Glycyrrhiza lepidota). Some of the older cottonwood forests occurring on sand are more open and xeric. These contain a large number of prairie grasses and forbs in the understory (Keammerer et al. 1975) including the tall-grass big bluestem and such forbs as Jerusalem artichoke, ground cherry (Physalis heterophylla) and fragrant giant hyssop (Agastache foeniculacium).

The Mesic Forest community generally occurs on the higher of the alluvial terraces in silty or clay soils. Overstory is provided by green ash, box elder, American elm and bur oak. This forest has a relatively closed canopy and lacks the tall shrub and sapling layer present in the preceding community although arrowwood (Viburnum lentago) may be relatively common. Lianas, or woody vines, including bittersweet and fox grape are common. Forbs present in this community include sweet cicely (Osmorhiza longistylis), Indian hemp (Apocynum sibiricum) and field mint (Johnson et al. 1976; Keammerer et al. 1975).

Johnson et al. (1976) determined densities of floodplain forest trees in the uninundated area from southern Burleigh County north to Garrison Dam. Highest densities were recorded for green ash (193.5 trees/hectare), cottonwood (191.3 trees/hectare) and box elder (105.0 trees/hectare). Bur oak had an average density on the floodplain of only 7.2 trees/hectare and was most abundant in upland mesic ravines (Hardwood Draw community). Basal area was largest for cottonwoods and the most frequent tree saplings were green ash and box elder.

The importance of the meandering of the Missouri River in influencing the floodplain forests was also indicated in the Johnson et al. (1976) study. Some of the area containing mature stands of trees in the early 1970's were part of the main river channel when the river was mapped in 1881-1882.

While the village Indians of the Middle Missouri subarea relied heavily on agricultural crops (e.g., Will and Spinden 1906), numerous wild plants were also utilized for a variety of purposes. These were frequently very important. For example, it was claimed by one early observer that the Indians knew may roots "which often preserve them from death during the frequent famines to which they are exposed" (Abel 1939:98). Berries of the numerous, abundant shrubs in draws and on the floodplain were an important food. The root of prairie turnip was also gathered in great quantities by nomadic as well as semisedentary groups. This plant was also a valuable item of barter for those who could obtain it (Abel 1939).

Based on distribution maps of the flora of the Great Plains (Great Plains Flora Association 1977), 644 species of vascular plants occur in Burleigh and Emmons counties, 558 of which are native taxa. In excess of 90 additional species occur on the right bank of the Missouri River in Morton, Oliver and/or Sioux counties. Of these, nearly 200 species are potential resources for either food, seasonings, medicines, fuel, construction and building materials, weapons components, or ceremonial uses.

Fauna

Most of the mammals found in the study area are equally common in both the Upper Sonoran life zone and the more northern and eastern Transition Zone within North Dakota (Bailey 1926). Specific to the Upper Sonoran Zone, however, are woodrats (Neotoma cinerea), prairie dogs (Cynomys ludovicianus), and, in the recent past, black-footed ferrets (Mustela nigripes) and badlands mountain sheep (Ovis canadensis auduboni).

Other mammals characteristic to both the Upper Sonoran and the Transition zone include Richardson ground squirrels (Spermophilus richardsonii), thirteen-lined ground squirrels (Spermophilus tridecemlineatus), several species of field mice (Peromyscus sp.), white-tailed jackrabbits (Lepus townsendii), cottontail rabbits (Sylvilagus floridanus), weasels (Mustela frenata), mink (Mustela vision), beaver (Castor canadensis), striped skunks (Mephitis mephitis), red foxes (Vulpes vulpes), coyotes (Canis latrans), white-tailed deer (Odocoileus virginianus), mule deer (Odocoileus hemionus) and antelope (Antilocapra americana). In the recent past, bison (Bison bison bison), elk (Cervus canadensis), wolves (Canis lupus), black bears (Ursus americanus) and grizzly bears (Ursus arctos) are known to have inhabited the study area (Bailey 1926).

Characteristic breeding birds include many varieties of raptors, waterfowl and perching birds. Bailey (1926) gives an extensive list of these species which include the mourning dove (Zenaidura macroura), burrowing owl (Speotyto cunicularia), great horned owl (Bubo virginianus), short-eared owl (Asio flammeus), Franklin gull (Larus pepixcan),

ferruginous hawk (Buteo regalis), Swainson's hawk (Buteo swainsoni), red-tailed hawk (Buteo jamaicensis), sharp-tailed grouse (Pedioecetes phasianellus), sage grouse (Centrocercus urophasianus), magpie (Pica pica) and canvasback duck (Aythya valisineria). Both bald (Haliaeetus leucocephalus) and golden (Aquila chrysaetos) eagles were observed during the field work. In addition, numerous water fowl and shorebirds migrate through this region.

Characteristic reptiles include the plains garter snake (Thamnophis radix), bull snake (Pitnophis sayi), prairie rattlesnake (Crotalus viridis), painted turtle (Chrysemys picta), snapping turtle (Chelydra serpentina) and horned toad (Phrynosoma douglassi). Common amphibians include the tiger salamander (Ambystoma tigrinum) and several varieties of frogs (Rana sp.) and toads (Bufo sp.; Wheeler 1954).

Fish species in the Missouri River are both abundant and highly subject to the influence of man. Archeological investigations just south of the study area at the Jake White Bull site (39C06) have revealed the presence of gar (Lepisosteus sp.), minnows and carp (Hypobis sp.), white sucker (Catostomus commersoni) and several varieties of catfish (Ictalurus sp.; Ahler 1977:175). In addition, Taber mentions the presence of sturgeon traps along some of the tributary streams to the Missouri (Abel 1939:92).

Many of the vertebrates mentioned in the preceding paragraphs were utilized by the prehistoric inhabitants of the Middle Missouri subarea. Primary among these must be considered the American buffalo or bison (Bison bison bison). Early historic accounts indicate that there were, at times, immense numbers of these animals along the Missouri River. Audubon, during his trips across the Dakotas in the 1840's, described the herds many times (in Bailey 1926:20):

In a cart heavily laden, he [James Kipp] passed through herds of buffalo for six days in succession. At another time he saw the great prairie near Fort Clark on the Missouri River, almost blackened by these animals, which covered the plain to the hills that bounded in all directions.

In 1833, Maximilian noted the habit of the buffalo of migrating back and forth across the Missouri during their spring and fall migrations (Thwaites 1906). Wilcox (in Bailey 1926:21) noted the same phenomenon in the spring of 1862:

At two different times our steamboat was obliged to stop, and tie up alongside the shore to avoid the immense herds of buffalo that were floating down the river. The first drove we encountered was near where Bismarck in North Dakota is now located. The river was nearly half a mile wide and was filled [to] nearly its entire width with live buffalos, and they were at least half an hour in passing. We encountered the other drove a little above the mouth of the Yellowstone and it must have contained at least 20,000 animals.

While aboriginal inhabitants in the Middle Missouri subarea utilized a number of methods to procure bison, including jumps, pounding and individual kills, the drowned animals from these river crossings offered a

unique resource base (Denig 1961:49):

The Arikaras are good swimmers, venture out on floating cakes of ice when the Missouri breaks up in the spring and bring ashore the drowned buffalo drifting by. Many of these animals in attempting to cross the river fall before the ice is strong enough, break through. Often whole herds are thus drowned, which remain in the mud until the ice starts, when they are carried down by the current...Although these drowned animals are so much putrefied that the meat will scarcely stick together, and can be eaten with a spoon in its raw state, yet these Indians devour it greedily...

Although there is no firm archeological evidence to substantiate it, Lehmer (1971:55) believes that the practice of using drowned buffalo was probably also employed during prehistoric times. Besides pointing out the importance of bison to the aboriginal subsistence pattern, the above passage also indicates that subsistence, both with and without horticulture, in the Middle Missouri was highly dependent on a combination of factors including the climate, the river itself and the biotic assemblage present in and adjacent to the valley.

In addition to bison, white-tailed deer, mule deer and antelope were highly utilized (Abel 1939; Will and Spinden 1906). Maximilian claimed that beaver were indispensable to the Mandan both for their skins and for their fleshy tails, considered a delicacy (Thomas and Ronnefeldt 1976:241). With the exception of horses and buzzards, Maximilian claimed the Mandans ate virtually any animal, including bear, wolf, fox and turtles.

Fieldwork Conditions

Environmental conditions during the 1983 fieldwork were generally favorable. Less than three days were lost to rain. The major environmental problems encountered were the undergrowth and deadfall encountered in the sampled bottomlands. In many of these areas, virtually no clear ground was visible.

Based on ocular estimate, surface visibility ranged from 50 to 90 percent in the upland areas inventoried. Visibility in the uplands was lowest in thick grass zones. It was substantially higher in recently cultivated fields and in eroded areas subjected to wave action.

The water level of Lake Oahe during the 1983 inventory ranged between 1614.99 feet (492.25 meters) and 1612.39 feet (491.46 meters) above mean sea level (information obtained from the Corps of Engineers, Area Engineer's Office, Pierre, South Dakota). Although water and driftwood obscured ground visibility in certain areas, two to ten meters of beach were usually visible.

CHAPTER THREE RESEARCH ORIENTATION

Many recent approaches to archeological site patterning have involved the potential interrelationships of site location with physiographic, locational, and environmental variables on a site locale or within the vicinity of the site. The question that immediately arises is which set of data, the environmental or the cultural, should be used as the predictor (i.e., that which the prediction of the other data type would be dependent upon)? One method implies that site patterning can be used to determine the elements of the environment which were being utilized:

Our most basic premise was that the way in which people distribute their residences over the ground surface is a sensitive indicator of how they interact with their natural environment and with other human beings. Thus, if one could determine how residences were distributed at various points in time, it should be possible to make some significant inferences about how people interacted with one another and with their natural surroundings [Sanders et al. 1979:15].

The potential complexity of such an open-ended approach usually, however, results in only limited success:

The problem with this reasoning, of course, is that once the distribution of residences for various prehistoric time periods had been described, how were we then to infer what these meant in terms of interactions with [the] natural environment and with other humans. This was the point at which we floundered, and are still, to some extent, floundering....What we have failed to do, and what no one has really ever done adequately, is to develop a series of models, by means of which the archaeologist can make reasonable sociological inferences from settlement pattern data [Sanders et al. 1979:15].

A less dynamic but usually more efficient approach is to develop a model, based on ethnographic, historic and archeological data, which specifies an environmental/locational data set that is believed to have influenced the selection of locales for inhabitation by humans:

The existence, and magnitude of human settlement in an area may be thought of as being contingent upon n environmental variables, from which there may be derived a set of n variables which are independent in the statistical sense...Thus, the set of all possible values that the n linearly independent variables can take forms an n-dimensional vector space. This is called the niche space (N)...The bounded subset of points in this n-space that includes the permissible values is the innermost intersection of

the subsets of permissible values on the n variables. This subset is called the fundamental niche of the population [Hudson 1969:367].

It is a variation of this latter approach which will be taken in the analysis of the Lake Oahe data. The study of the 1983 results considered only prehistoric localities. The rationale for selection of the environmental variables to be used is just as valid for historic localities, however. Future studies of this nature conducted by Larson-Tibesar Associates will examine both prehistoric and historic localities. The 1983 prehistoric data are considered as a starting point from which to build more complex models incorporating greater temporal and spatial parameters.

Proximity to resources has been proposed as a major factor in the determination of site location (e.g., Jochim 1976). It has been suggested that such proximity minimizes the amount of human energy expended in order to acquire a specific set of resources (e.g., Plog and Hill 1971). Furthermore, proximity to a greater diversity of environmental settings may result in greater resource productivity (e.g., Reher and Witter 1977) and/or greater resource predictability (e.g., Fawcett and Francis 1981).

Most of the studies mentioned in the preceding paragraph deal with either contemporary, ethnohistoric, or prehistoric hunter-gatherer groups. Within the Middle Missouri subarea, it is obvious that not all aboriginal inhabitants were simple hunter-gatherers. Horticulture is known to have been practiced by cultural groups associated with the various Middle Missouri and Coalescent traditions and may have been in use by earlier Woodland cultures. Maize horticulture, even in its incipient stages, requires some degree of tending and this would result in altered subsistence patterns. It remains to be seen, however, if such changes in subsistence are detectable in changes in settlement pattern. The approach taken in the present analysis was to test a basic hunter-gatherer model and to propose alterations to that model which might be the result of the advent of, or increased dependence upon, horticulture in the subarea.

Most environmental variables were selected for use in analysis because their value has been demonstrated in previous studies. Several new variables were chosen because it was believed that they might indirectly reflect information about data which are not directly available for the study area. A final logistical consideration also entered into the selection process for environmental variables. The planned analyses were to deal with prehistoric cultural resource locations and a number of randomly selected points at which prehistoric cultural resources were not detected. The number and location of the random points could not be determined until the field inventory was completed. Thus, the types of environmental data to be collected were those which could be gathered from printed sources, without revisiting the actual field locations.

The environmental variables considered in the analysis of the 1983 Lake Oahe data were: a) horizontal distance to the center of the Missouri River, b) horizontal distance to the closest tributary to the Missouri River, c) horizontal distance to the second closest tributary to the Missouri River, d) sinuosity index of the Missouri River at its closest point to the locale, e) on-location slope, f) aspect, g) area of tree cover within a two mile radius of the locale, h) area of brush cover within a two mile radius,

i) distance to the closest timber, and j) on-location soil type. The reasons for selection of these variables and the techniques used to calculate them are presented in Analysis, Chapter Seven.

The analysis proposed for the 1983 cultural resource inventory of Lake Oahe also involved collecting the information necessary to classify prehistoric locales into typed categories. Prehistoric cultural manifestations encountered during the inventory were examined in order to determine the span of temporal and functional variation in the study area. With that information in hand, it was believed that the classification schemes for other types of analyses would be better founded. Where possible, observed artifacts, features and sites were compared to published syntheses (e.g., Lehmer 1971; Wedel 1961; Frison 1978) in order to make the best possible assessment of age and function. Several research topics were then addressed using these data:

- 1) On both sides of the river, there appear to be two distinct clusters of Woodland sites, one between Huff and Fort Rice and another from Fort Yates south to the State line. Can these patterns be substantiated and, if so, what are their implications in terms of cultural adaptation to the area?
- 2) There is an obvious concentration of village sites (Extended Middle Missouri, Terminal Middle Missouri and Post-Contact Coalescent) in the northern portion of the Cannonball region and adjoining southern portion of the Knife-Heart region. Can the environmental factors influencing this settlement pattern be quantified?
- 3) The literature indicates the historic Arikara used the study area as part of their hunting territory. Can such camps be found and identified?
- 4) Can the purported Yanktonai villages which may have existed in the southern portion of the study area be found and identified?
- 5) In addition to Arikara hunting camps, can other "extra-village activity areas" (e.g., Steinacker 1981:93) be located and, if so, which traditions and variants will they be related to?
- 6) Do site attributes such as site size and ceramic assemblages bear out the usual interpretation that, in the upper Cannonball region, all village sites which are small and unfortified are from the Extended Middle Missouri variant, while all sites from the Terminal Middle Missouri variant are large and fortified (e.g., Thiessen 1976; Sperry 1982)?

The information gathered during the 1983 inventory which relates to these questions is presented in Chapter Seven. For the purposes of settlement pattern analysis, however, it was necessary to group prehistoric manifestations into three basic categories. The categories used in analysis are: a) earthlodge villages, b) all other prehistoric sites, and c) prehistoric isolated finds. Any other subdivisions considered would have resulted in one or more groups with extremely small population size. It was also not possible to subdivide data on the basis of age because so many of the locales recorded did not yield temporal diagnostics. Further

1

discussion of the site types utilized in settlement pattern analysis is presented in Chapter Seven.

CHAPTER FOUR PREHISTORIC/PROTOHISTORIC OVERVIEW

The prehistoric and protohistoric cultural patterns for the study area are well outlined by Wood (1983) and it is not believed that there is a need to repeat that document in its entirety here. There is, however, a need to expand the discussion of several problem areas which arise when trying to utilize extant cultural chronologies in a surface inventory. It is also necessary to incorporate new information which has been gathered since the Wood's 1983 manuscript was prepared.

Following the spatial terminology utilized by Lehmer (1971:28-29), the study area is considered to be within the northern three-quarters of the Cannonball region of the Middle Missouri subarea. The Middle Missouri subarea is, in turn, part of the Plains area. Within the Cannonball region sites are known, or can reasonably be expected, to exist which reflect Paleoindian, Archaic, Woodland, Plains Village and general Late Prehistoric/Protohistoric hunter-gatherer populations. The problem to be addressed in the remainder of the chapter involves how best to classify, codify and describe these components.

Most recent classifications of archeological units in the Great Plains have either directly or indirectly indicated that both chronological control and a concept of cultural-historical development are necessary in order to best describe prehistoric manifestations. The traditional concept of a "period" as a rigid block of time (e.g., Krieger 1953:247) is not a sufficient scheme by itself. This is because various cultural manifestations are now known to have overlapped and coexisted on both sides of arbitrary time lines. On the other hand, the use of the unmodified cultural-historical development scheme as developed by Willey and Phillips (1958) would tend to disregard or overlook basic and important research questions which are clearly related to absolute chronology.

A number of writers have attempted to resolve this problem. In his discussion of the prehistory of the Plains area Willey (1966:311-313) uses what are essentially two separate schemes: cultural traditions to discuss the characteristics of prehistoric lifeways and cultural periods to describe absolute blocks of time. Lehmer (1971:29-30) uses the term "period" to indicate "an epoch during which there was a dominance of a particular culture climax, or major cultural tradition..." This would seem to imply that, while Lehmer did draw somewhat arbitrary lines to divide his periods, he realized that such lines only delimited the "dominance" of a particular cultural tradition and not necessarily its total existence in time. Frison, taking a different approach, suggests that the term "period" should be used to reflect changes in economic subsistence patterns: "cultural stages are involved and arbitrary time lines are not realistic unless there are concomitant observable cultural changes" (Frison 1978:20).

The differences between these three approaches can be seen in Figure 4.1. Since they are entirely separate concepts, Willey's (Figure 4.1a) phases and cultures crosscut his periods. For the Central Plains and Middle Missouri subareas, Lehmer presents complexes and traditions which are contained within period boundaries (Figure 4.1b) since these are seen as the major or dominant manifestations within all of or a portion of a period. On the other hand, Lehmer seems to contradict himself in that "foraging complexes" in the Northwestern Plains subarea are viewed in a more fluid manner which allows them to crosscut periods. Although less detailed, Lehmer's description of Northwestern Plains complexes is consistent in philosophy with the scheme presented by Frison (i.e., that such units represent economic subsistence patterns, not blocks of time; see Figure 4.1c).

Since none of the schemata discussed above have received universal acceptance in the Plains, it would seem to be advantageous to combine the most useful characteristics of each so that the most accurate comparisons can be drawn. Figure 4.2 presents a chronological and developmental sequence which will be used throughout the rest of this report. As with Willey's (1966) presentation, an explicit distinction has been made between chronological units (periods) and units which more closely correspond to cultural-historical development (traditions, variants, phases, etc.). However, greatly increased data since the publishing of Willey's synthesis make the categories used by him somewhat inadequate.

For the purposes of this study, the chronological framework proposed for the Northwestern Plains by Frison (1978) has been expanded to include the Middle Missouri subarea. This scheme is utilized since it categorizes more recently discovered and/or dated cultural components and also articulates quite well with previously recognized sequences in the Middle Missouri subarea (Lehmer 1971).

It should be noted that, while the terms for the periods utilized by Frison are the same, his concept of overlapping periods (see Figure 4.1c) has not been incorporated here. It is believed that a more appropriate term for such a concept is "tradition." "A (primarily) temporal continuity represented by persistent configurations in single technologies or other systems of related forms" (Willey and Phillips 1958:37). As with Willey's original scheme for the Plains, the names for many periods and traditions are the same. This is closely analogous to Lehmer's (1971:29) concept in that the period name reflects the "dominance of a particular culture climax, or major cultural tradition."

A concept of "variant" is not present within the original Willey and Phillips scheme. The term was originally used by Lehmer (1968:9) in the Middle Missouri subarea and was later extended to the Central Plains by Krause (1969:95). Krause (1977:10) defines the variant as:

a mid-range taxon which has less content, greater time span and greater spatial spread than a phase, but less time span than a tradition and less spatial spread than a horizon....So construed, the variant fits securely within the paradigmatic logic of the Willey and Phillips System.

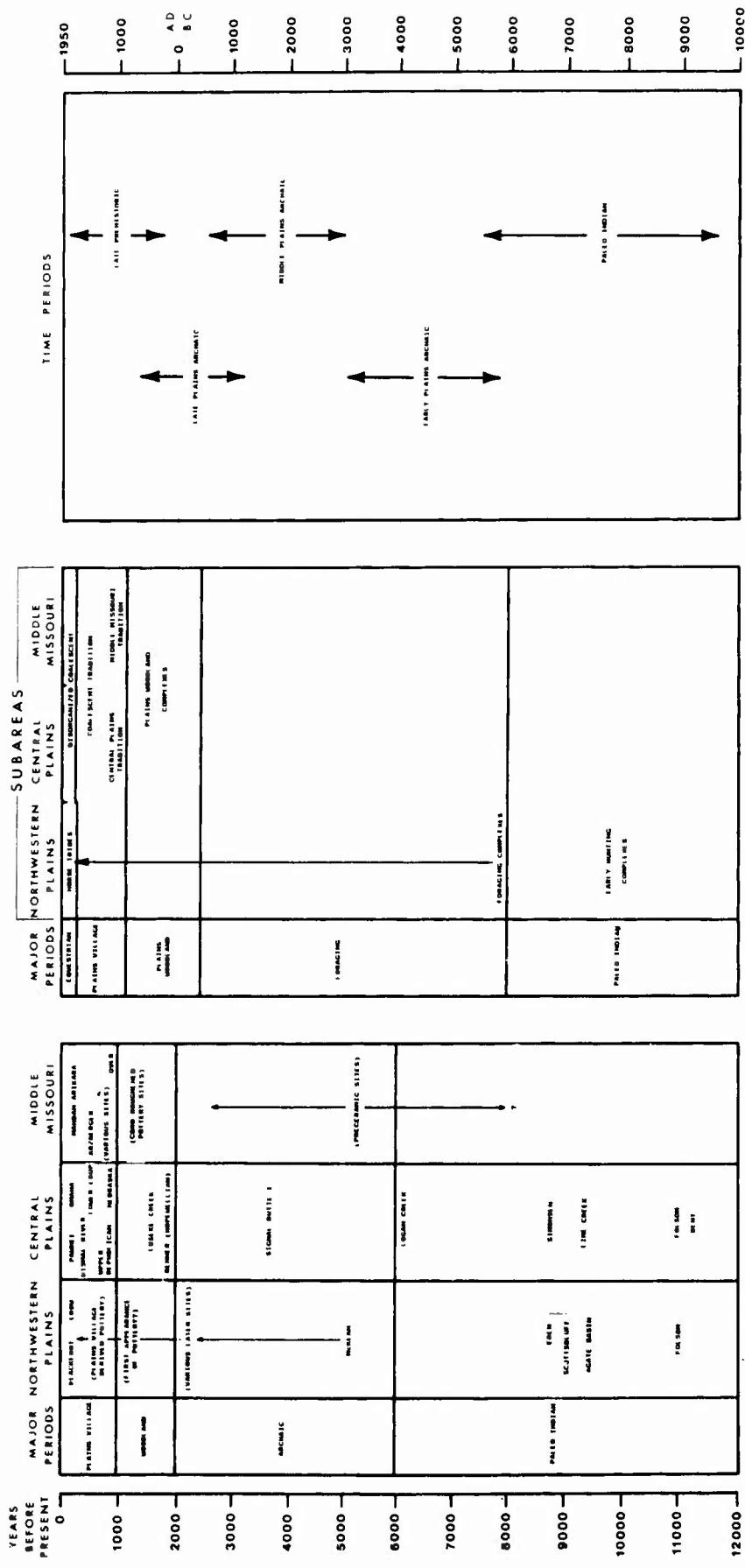


Figure 4.1. Taxonomic schemes which have been proposed for the Plains. Figure 4.1a adapted from Willey (1966); Figure 4.1b from Lehmer (1971); and Figure 4.1c, developed for the Northwestern Plains, adapted from Frison (1978).

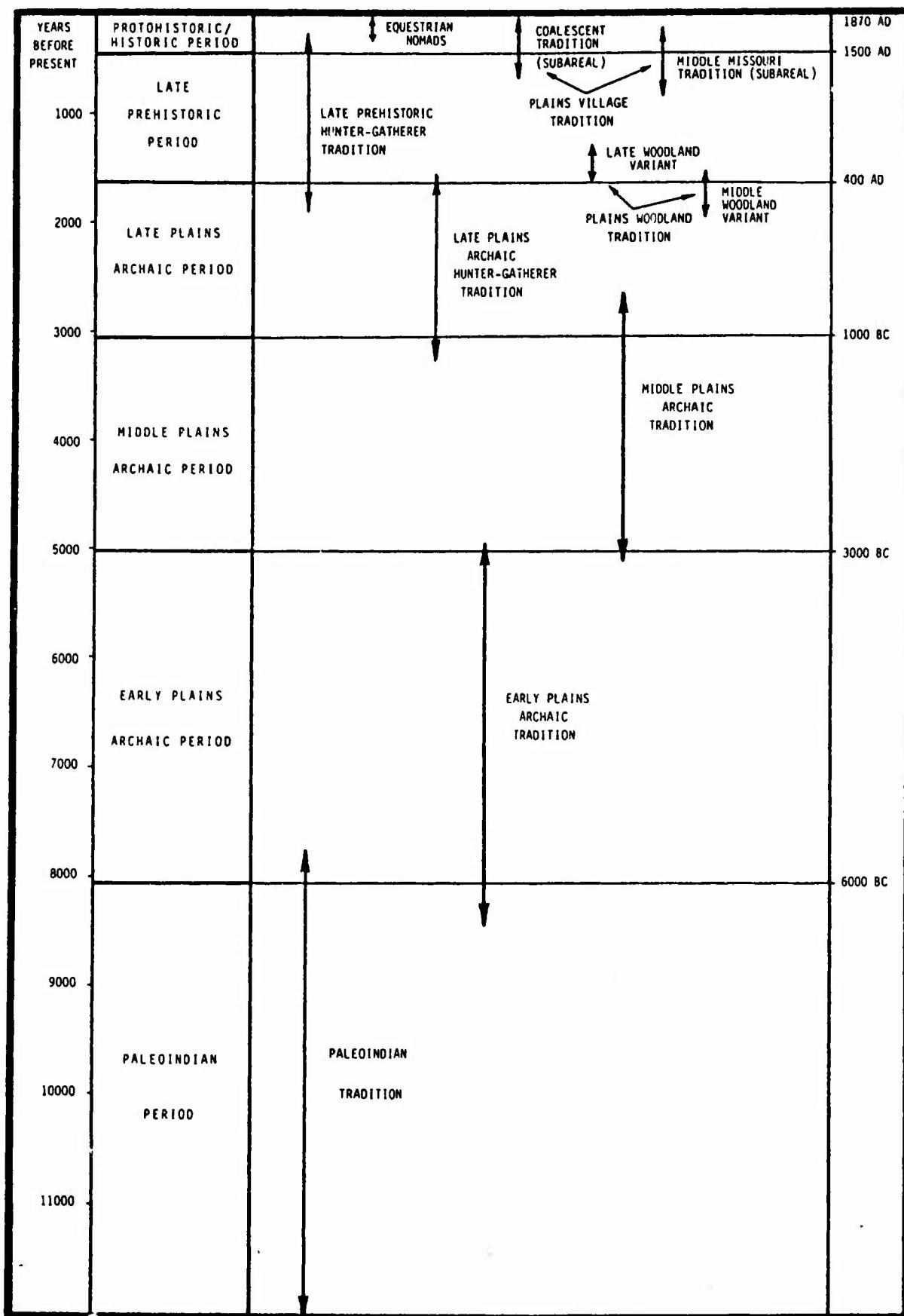


Figure 4.2. Proposed taxonomic scheme for cultural manifestations encountered during the 1983 Lake Oahe survey.

Many objections have been raised concerning the use of the term (e.g., Blakeslee et al. 1982; Zeier 1982). For the purposes of this study, variant is viewed as a viable taxon and its use has been somewhat expanded to refer to Woodland as well as Plains Village components (see Figure 4.2). The subdivisions of Plains Woodland (Middle Woodland, Late Woodland, etc.) are here considered variants. Should it be possible in the future to clearly define regional taxa within these Woodland variants, these would be considered as phases under the scheme presented here (e.g., "the Sonota phase").

As Figure 4.2 illustrates, the known temporal span of many traditions and/or variants is such that they overlap one another in time. This is particularly true for cultural manifestations which occurred from the last one-third of the Late Plains Archaic period up to the Protohistoric/Historic period. Due to these overlaps, for instance, no "Woodland period" can be recognized since various Woodland manifestations now appear to have co-occurred with other groups both during the Late Plains Archaic and the Late Prehistoric periods (see Figure 4.2).

It is important to understand the potential ramifications of such temporal overlap to the present study. In many cases neither relative nor absolute dates, by themselves, should be used to conclusively link an archeological manifestation to a particular cultural tradition, variant or phase. To do so greatly oversimplifies what is known about the archeological record, particularly during the last two thousand years.

The variants and phases of the Middle Missouri and Coalescent traditions relevant to the study area are well summarized by Wood (1983:31-37). Likewise, the data for the Paleoindian, Early Archaic and Middle Archaic periods have not changed significantly since Wood's (1983) document was prepared, and there is no need to repeat that information here. A summary of the excavated sites in or near the project area with reference to their position in the taxonomic scheme is presented in Table 4.1. Several of the traditions which existed during the Late Plains Archaic and Late Prehistoric periods are presented here somewhat differently, however, and it is necessary to discuss these further.

During the Late Plains Archaic period and the beginning of the Late Prehistoric period, a distinction is recognized between the Late Plains Archaic Hunter-Gatherer tradition and the Plains Woodland tradition (see Figure 4.2). A number of sites either within or very near to the study area have been recorded which contain projectile point varieties (e.g. Pelican Lake materials) which are known to date from the Late Plains Archaic period and which are not believed to be related to the Plains Woodland tradition. Additionally, since ample data are available to link Besant projectile points to both Woodland and Late Archaic hunter-gatherer traditions (Wettlaufer 1955; Neuman 1961; Frison 1971; Johnson 1977), it is not believed the presence of these points on a site can automatically be assumed to indicate a Woodland occupation. The environmental setting of the Missouri Valley would probably have been equally as attractive to generalized hunter-gatherers as it was to incipient horticulturalists. Indeed, as further research is conducted in the region, it seems likely that the distinctions between the two types of groups will be quite subtle and difficult to quantify.

Table 4.1. Excavated sites in the general area of the project.*

Site No.	Site Name	Instit.	Excavator	Years Worked	Cultural Unit	References
32BL8	Double Ditch	HU	Will	1905	HRP	Will & Spinden 1906
32EM1**	Havens	SHSND	Sperry	1967-8	EMM	Sperry 1982
32EM3	Tony Glas	SHSND	Howard	1958	EMM	Howard 1958
32EM10**	Shermer	SHSND	Sperry	1965-6	TMM	Sperry 1968
32EM21**		UND	Gregg	1980	Woodland	Root and Gregg 1983b
32M02	Bendish	MWAC	Johnston	1969	EMM	Thiessen 1975
32M011	Huff	SHSND	Hecker Howard Wood	1938 1959 1960	TMM	Will, Hecker 1944 Howard 1962 Wood 1967
32M020	Schmidt Mound	MBP	Neuman	1960	Woodland	Neuman 1975
32M026	On-a-Slant	CU UND	Strong Schneider	1938 1979	HRP	Strong 1940 Ahler et al. 1981
32M037	Boley	DC	Lehmer	1964	HRP	Lehmer n.d.
32M0207	Unnamed mound	MBP	Neuman	1960	Woodland?	Neuman 1961
32SI1	Boundary Mounds	SHSND MBP	Wood Neuman	1956 1960	Woodland	Wood 1960 Neuman 1975
32SI2	Fire Heart	SHSND	Lehmer	1964	EMM, DC	Lehmer 1966
32SI3	Robert Zahn	SHSND	Woolworth	1955	EMM	Wood, Woolworth 1964
32SI4	Paul Brave	SHSND	Woolworth	1955	EMM	Wood, Woolworth 1964
32SI6	Porcupine Creek	SHSND	Scheans	1957	Woodland, Scheans 1957 Historic Dakota	
32SI7	Ben Standing Soldier	MBP	Hoffman	1965	EMM	Hoffman n.d.
32SI8	Jerome Standing Soldier	SHSND	Scheans	1957	EMM, Historic Dakota	Scheans 1957

Table 4.1(cont.). Excavated sites in the general area of the project.*

32SI9	South Cannonball	MBP	Hoffman Johnston	1965 1966-7	EMM	Griffin n.d.
32SI76	Yellowlodge	SHSND	Scheans	1957	Historic Dakota	Scheans 1957
32SI77	Meadow	SHSND	Scheans	1957	EC	Scheans 1957
32SI200	Alkire Mound	SHSND	Lehmer	1964	Woodland	Henning 1965
39C01	Demery	SHSND	Woolworth	1956	EC	Woolworth and Wood 1964

* Adapted and updated from Wood (1983) and Lehmer (1971:Appendix 1)

** Within project area

INSTITUTIONS

CU	Columbia University
DC	Dana College, Blair, Nebraska
HU	Harvard University
MBP	Missouri Basin Project, Smithsonian Institution
MWAC	Midwest Archeological Center, National Park Service
SHSND	State Historical Society of North Dakota
UND	University of North Dakota, Grand Forks

CULTURAL UNITS

EMM	Extended Middle Missouri variant
TMM	Terminal Middle Missouri variant
EC	Extended Coalescent variant
HRP	Heart River phase, Post-Contact Coalescent variant
DC	Disorganized Coalescent variant

Two variants within the Plains Woodland tradition are also proposed. While the evidence for a Late Woodland variant is still relatively rare, sites such as 32M098 (Larson et al. 1983:136), the Jamestown Mound group (Snortland-Coles:1983), the Magpie Road site (Campbell et al. 1983), and data from the Cross Ranch inventory (Ahler, Lee and Falk 1981) all point to the existence of Late Woodland cultures in the Northern Plains whose weaponry, ceramics, and, perhaps, mode of subsistence were distinctly different from the preceding Middle Woodland cultures. It is these types of sites which are considered part of the Late Woodland variant under the taxonomic scheme presented in this chapter.

It is also believed that evidence exists which documents the presence of Late Prehistoric hunter-gatherers and equestrian nomads within the study area. While they no doubt interacted, these groups are believed to have been distinctively separate from the better documented Plains Village cultures of the region.

CHAPTER FIVE HISTORICAL OVERVIEW*

The Fur Trade and Early Exploration

In 1731 Pierre Gaultier de Varennes, Sieur de La Verendrye, began a search for an overland route from the Great Lakes to the Pacific. Verendrye had been granted permission by Louis XV of France, then ruler of Canada, to conduct the expedition at his own expense. In return, La Verendrye was granted a monopoly of the fur trade that might develop as a result of his expeditions. La Verendrye received financial support for his expeditions from Montreal merchants eager to become part of the resulting fur trade monopoly. La Verendrye established forts and trading posts from Lake Superior to Lake of the Woods, Lake Winnipeg, and on the Red and Assiniboine Rivers (Burpee 1927).

In 1738 La Verendrye built Fort la Reine at the point where an established trail crossed the Assiniboine River. This trail had apparently developed as a trade route by which the Missouri Valley tribes and the Assiniboine journeyed north to meet Cree traders. La Verendrye had received reports that a tribe of light-skinned Indians lived on a westward flowing river and in 1738 he departed Fort La Reine in the company of his two sons and twenty other men. The route followed by the party has remained a matter of conjecture, but it is known that he reached the Missouri River on November 28, 1738.

In 1742-1743 two of Verendrye's sons journeyed to the Missouri River villages and travelled far to the west and south, probably into present Wyoming and South Dakota. The failure of these expeditions to locate the western sea did not detract from their importance to the Montreal-based fur trade, which would monopolize the Assiniboine-Souris-Missouri River area until the 1780's (Burpee 1927; Schweigert 1979:18; Reid 1965; Libby 1916).

The Montreal-based trade with the Missouri River tribes appears to have been dormant in the period 1738 to 1770, probably due to a depressed economy in New France caused by almost continuous war between France, Spain and England during that period. By the early 1770's, however, Montreal-based British traders had begun visiting the Mandan villages on a regular basis (Gates 1933:39, 51).

The profitability of the Missouri village trade probably tapered off rapidly after the establishment of competition for the furs. The North

* Editor's note: This chapter is a condensed and slightly updated version of a previously published document (Schweigert 1983b). The shorter version presented here reflects the fact that the 1983 inventory deals only with the left bank of Lake Oahe.

West Company apparently maintained a virtual monopoly of this trade from 1783 to 1793, but by 1805 that company had abandoned attempts to organize the Missouri River trade in its favor. Although British trading would continue at the Missouri villages until 1821, that trade was incidental to the interests of the major fur companies.

The British presence on the Missouri alarmed the Spanish, who in 1794, organized the Missouri Company at St. Louis to open Spanish trade and quell the British influence. Backed by the Missouri Company, Jean Baptiste Trudeau formed an expedition to build a fort among the Mandans and to determine the distance to the Rocky Mountains. Trudeau's expedition only reached the mouth of the Grand River in 1795 and returned to St. Louis without locating the Mandan villages. In the fall of 1796 another Missouri Company expedition, led by John Evans, reached the Mandan villages and forbade trade with the British. The Spanish authority at St. Louis was too remote for maintenance of sovereignty on the Upper Missouri and the existing trade relations with the British were strong. The Spanish traders fell into disfavor and the Indians continued to trade with the British companies (Robinson 1966:36-38). The Missouri River drainage remained the property of Spain until ceded back to France in 1800. In 1803 France sold the Missouri River drainage to the United States as part of the Louisiana Purchase.

In January 1803, President Jefferson, anticipating this purchase, proposed a scientific expedition to the western ocean (Eide 1969:2):

While other civilized nations have encountered great expense to enlarge the boundaries of knowledge by undertaking voyages of discovery for other literary purposes, in various parts and directions, our nation seems to owe to the same object as well as to its own interests, to explore this, the only line of easy communications across the continent.

Thus was the Lewis and Clark Expedition set in motion, at a time prior to this nation's somewhat unexpected acquisition of the territory which the expedition was to explore. The Louisiana Purchase in effect legitimized the true purpose of the expedition (Eide 1969:3-8).

The expedition assembled and wintered near the mouth of Wood River in Illinois, opposite the mouth of the Missouri. The group began its journey up the Missouri at 4:00 p.m. on Monday, May 14, 1804. Lewis and Clark reached what is now North Dakota on October 14, 1804. Between then and October 20, the explorers camped in at least seven locations in or near the project area.

The party met several hunting parties of Arikara with whom they visited and exchanged gifts. On the way to the October 16 campsite the expedition passed an old "Cheyenne fort," and also viewed large numbers of animals driven into the Missouri and killed by Indians. At the October 18 campsite the Lewis and Clark party met two French hunters and trappers who had been robbed of their furs and traps by the Mandans. The hunters followed the party in the hope of recovering their lost property (Mattison 1953:173-185).

1

There are very few other references which would specifically relate to the project area within the Lewis and Clark records. The October 14 to October 20 campsites of the expedition are all believed to have been either eroded or inundated by the Missouri River.

Following the Lewis and Clark journey, the next government expedition to pass through the project area was in 1825. An expedition under General Henry Atkinson, accompanied by Benjamin O'Fallon, Indian Agent, headed north from Council Bluffs in eight keelboats of unique propulsion. The boats were equipped with paddle wheels which were turned by hand by the soldiers (Chittenden 1962:383). Treaties were signed with sixteen tribes from Council Bluffs to the Knife River. Atkinson reported on his return that he found no British influence and that no fort was required above Council Bluffs. While occasional hostilities were to continue for another fifteen years, the Upper Missouri had, at least in part, been opened to the American fur trade (Robinson 1966:85; Dunn 1963:179).

The dominant trading firm in the United States at the time was the American Fur Company, chartered in New York by John Jacob Astor in 1808 with a capital of a million dollars. The company was the foundation of the great Astor fortune, the largest in the nation at his death in 1848. Astor was an able, shrewd and ruthless man, and those characteristics were reflected in the Company's policies. In 1822, the Western Department was organized in St. Louis, and in 1827 Astor entered a partnership with Bernard Pratte and Company. The company furnished the goods and marketed the furs and Pratte supervised the actual trade. Profits and losses were to be shared equally. For the following forty years the company, be it the American Fur Company or its successors, Pratte, Chouteau and Company, or Pierre Chouteau, Jr., and Company, would hold nearly complete control of all trade on the Upper Missouri River (Robinson 1966:86-87).

By 1838 the best years had passed for the American fur trade in the region. The streams of the Northern Plains had been profitably and destructively exploited. Accumulating suitable quantities of pelts became difficult, at best, and the buffalo robe trade had not yet begun. After the Arikara moved from the Grand and Heart rivers, the Missouri Valley in the vicinity of the study area was left to the Sioux who were neither accustomed to trapping nor particularly friendly toward white Americans.

Two temporary trading posts may have been established in the vicinity of the project area, but solid evidence for the locations, nature and dates of these establishments has not been found. Hiram Chittenden indicated "Mitchell's Post" on the west side of the Missouri several miles north of the Cannonball River, and "Bois Post" opposite and just above the mouth of the Cannonball. These two posts may have been in opposition to each other, but unfortunately Chittenden does not mention either of these in the text or appendices of his work (Chittenden 1902). He does mention an American Fur Company trader named Bois who was active at Fort Pierre in 1842 (Chittenden 1902: 371 and passim). Around that date the Fox, Livingston Company was opposing the American Fur Company at many locations on the Missouri River, and it is possible that Bois and Mitchell operated their namesake posts for these opposing companies.

Gouvernor K. Warren of the United States Topographic Engineers noted on maps of an exploration, which probably took place in 1855, an "Old T.H."

[trading house] just above the mouth of Long Lake Creek, now known as Badger Creek. Several popular maps of the years following Warren's 1858 publication apparently copied much information from his map with varying degrees of accuracy. An 1871 plat shows the post above the north side of Long Lake Creek (Mitchell 1871). An 1873 map in German shows an "Old Trading House" on the west side of the Missouri across from the mouth of Long Lake Creek, but an 1879 copy of the same map shows an "Old Trading Post" on the east side of the Missouri, approximately due north of Fort Rice along the edge of a west-facing escarpment (Pettermann 1873, 1879). An 1875 map shows an "Old Trading House" at the mouth of Long Lake Creek, apparently on the south side of the confluence (Warren 1875). Other than the Warren map, all of this evidence is viewed as unreliable because of the absence of supporting information. Information about these posts may exist in the logs of steamboats which navigated the upper Missouri in the period 1842-1860, or may be found in a list of prospective trading sites in the charter of the Fox, Livingston Company, but the author did not have access to either.

The Indian Wars Era

At the Laramie Treaty in 1851, the Northern Plains tribes agreed to allow travel along the Oregon Trail through Nebraska and Wyoming. To aid in policing the plains, the army bought Fort Pierre from the American Fur Company in 1855 and built Fort Randall farther downstream in 1856. With the settlement of Iowa and southern Minnesota, white interest in southeastern Dakota increased and in 1858 the Yankton ceded fourteen million acres in what is now southeastern South Dakota. Settlements sprang up at Yankton, Sioux Falls and Vermillion, and Dakota Territory was organized to include all of present North Dakota and South Dakota, most of Montana, and about the northern sixty percent of Wyoming (Robinson 1966:98-99).

Santee Sioux attacks along the Minnesota River resulted in the Sibley and Sully military campaigns of 1863 and 1864. Because these campaigns either crossed or came quite near to the present project area, it is of importance to briefly discuss the events.

In the summer of 1863 Sibley was to advance toward the Missouri from Minnesota with a force of 2,800 men while Sully with 2,000 men would come up the Missouri River to cut the Sioux off. Sibley fought the Sioux along a route north of present Interstate 94 with battles north of present Tappen, Dawson and Driscoll, North Dakota. Sully's upstream journey had been delayed by the low water and he had not reached the site of present Bismarck where the Sioux crossed the Missouri fleeing from Sibley. Sibley's troops were exhausted and did not pursue further. He estimated that 150 Indians and nine soldiers had been killed (Robinson 1966:100).

After Sibley's troops returned to Minnesota, the Sioux recrossed the Missouri River to hunt buffalo along the James River. Sully finally reached their camp south of present Merricourt in northwest Dickey County, North Dakota. The Indians offered some of their chiefs as hostages to demonstrate their good intentions, but Sully demanded unconditional surrender. The Sioux balked and started to abandon their camp and Sully's troops attacked. One hundred fifty Indians were killed and 156 were taken prisoner. Three hundred lodges and nearly half a million pounds of buffalo meat

were burned, and the Indians' horses were shot (Robinson 1966:101). Sully lost twenty of his troops (Robinson 1966:100-101).

The next year, 1864, Sully ascended the Missouri River with 2,500 men. After building Fort Rice above the mouth of the Cannonball (on the right bank of the river, west of the study area), Sully's forces marched west and found Sioux encamped in the Killdeer Mountains of present Dunn County, North Dakota (Mattison 1954:3-4). These were Teton and Yanktonai who had had nothing to do with the hostilites in Minnesota.

Sulley's artillery broke up the camp and his men destroyed the abandoned property, but were unable to successfully pursue the Indians in the rough, broken territory. Sully led a grueling march through the badlands while the Sioux sniped at them and stampeded their horses. At the Yellowstone River, Sully and his men were met by steamboats and returned downstream, leaving small detachments of soldiers at Fort Union and Fort Berthold (Robinson 1966:101).

Besides Fort Rice, several locales relating to these campaigns are known to be present in the general vicinity of the project area. Sibley's attack on the 1863 Sioux crossing of the Missouri River was marked by a grave stone as late as 1936. The location of Sibley's "Camp Slaughter" of 1863 is also known (records of the State Historical Society of North Dakota; see also, Appendix B of this report). Both sites are near the northern end of the project area, but they are well outside of the specific areas inventoried. No previously recorded or newly recorded sites relating to the Sully or Sibley campaigns exist within the project area.

The establishment of Fort Rice grew out of the government's realization that a permanent military force would be necessary to contain hostile Indians and protect overland and Missouri River transportation routes. General Sully had been ordered to build the post near Long Lake, probably due to an error in then-existing maps. Because he found no suitable spot there, he returned to the Missouri River and chose a site on the west bank which offered relatively high ground immediately above the river, good grazing, and timber. The site was six miles above the mouth of the Cannonball River, across the river from the abandoned McElry trading post. The presence of Fort Rice at first seemed to increase the hostility of the Sioux, and attacks on lone mail carriers, steamboats and woodcutters continued and increased after 1864. Between October 1864 and May 1865 six companies of the First U.S. Volunteers, comprised mostly of former Confederate prisoners of war, were stationed at Fort Rice. During that period 81 men died, only eight of whom were killed by Indians, while 37 died of scurvy (Mattison 1953:180).

Beginning in 1865, the United States government attempted to forge treaties with the tribes of the Central Plains and Northern Plains. Many of the Sioux bands accepted at Fort Rice the provisions of the Fort Laramie Treaty of 1868. In exchange for annuities, closing of the Bozeman Trail, and other services, the Plains tribes for the first time accepted reservation areas and agreed to allow construction of a railroad through the region (Mattison 1953:182).

In 1871, surveys for a route for the Northern Pacific Railroad reached the Missouri River at Edwinton (Bismarck), and in that year and the

1

following two years surveys extended from Edwinton into the Yellowstone Valley in Montana. The latter surveys were led by General Stanley and Colonel Whistler, and large military escorts were provided to the survey crews in part from the garrison at Fort Rice. The fort also served as the provisioning depot and assembly point for these expeditions (Mattison 1953:182-184).

On June 14, 1872, a temporary military camp was established near the projected rail line on the west side of the Missouri River and on August 15, 1872, the camp was moved downstream and named Fort McKean. In November of the same year the post name was changed to Fort Abraham Lincoln, and the original infantry detachment was joined by a large force of cavalry (Carroll and Frost 1976:3; Robinson 1966:102, 127). Fort Abraham Lincoln quickly supplanted Fort Rice as the most important military post in the Northern Plains. In part this was because it could be supplied not only by steamboat but also by railroad, which reached Edwinton in 1873. The railroad would not be built into the area west of the Missouri until 1879, but in that time Fort Abraham Lincoln would play a central role in the development of the American West.

Colonel George Armstrong Custer assumed nominal command of Fort Abraham Lincoln in 1873. In the summer of 1874 Custer led a large "mapping" expedition to the Black Hills of South Dakota. Gold was discovered there in paying quantities by miners with the party. News of the discoveries reached the booming railroad town of Cheyenne, Wyoming, almost immediately and a considerable prospecting rush began. The Black Hills were sacred to the Sioux, Arapaho and Cheyenne and had been guaranteed to the Sioux by the 1868 Fort Laramie Treaty. The Army removed several groups of prospectors from the Black Hills in 1874, but by mid-summer of 1875 hundreds of miners were prospecting there. Indians and whites made numerous attacks on each other during that summer, both in the Black Hills and to the south. Faced with massive public pressure and increasing violence, the government demanded that all Sioux present themselves at the agencies on the Missouri River in November 1875 or be considered hostile. Many bands could not be contacted before the deadline, especially those who were engaged in traditional bison hunting in what would become northern Wyoming and Montana.

Many Sioux and Cheyenne who went to the agencies found short rations, virtually no game, and mounting apprehensions that the Army would confiscate their horses and firearms. Throughout the winter and into the spring of 1876, groups of Sioux left the agencies to join the "hostiles" in the best remaining hunting territory near the Bighorn River. In May 1876, the United States Army began a campaign against the wandering Sioux and other non-agency Indians who were reported to have met in a grand encampment near the mouth of the Little Big Horn River. Although the major battle ended rather surprisingly for Custer and his immediate command, the hostile Indians were hounded by the army until they either surrendered or, like Sitting Bull, escaped to Canada (Hanson 1909:290-376; Robinson 1966:178).

Under provisions of the 1868 treaty an Indian agency was operated on the Grand River which principally served as a distribution point for annuities and an intelligence gathering point for the government. In July 1873, Major Palmer, the Indian Agent at Grand River, was given orders to build an agency on a new site. Palmer selected a site 32 miles south of

Fort Rice. The post was named Standing Rock Agency for a nearby stone prominent in Sioux and Arikara mythology (Mattison 1953:159-160).

The military contingent which had been stationed at the Grand River Agency was transferred to Standing Rock Agency, and Grand River became a sub-agency. With military posts at Standing Rock and Fort Abraham Lincoln, and with the hostile Sioux chased into Canada, the need for Fort Rice diminished and it was abandoned in early 1878. In accordance with General Order No. 9, the name of the garrison at Standing Rock Agency became Fort Yates on December 30, 1878. The new fort was named for Captain George W. Yates of the Seventh Cavalry, who died in the Battle of the Little Big Horn. After 1880 Fort Yates would be one of the largest military posts on the Northern Plains. The fort was located on the site of the present town of Fort Yates, on the right bank of Lake Oahe.

Starvation and a desire to return home led Sitting Bull and his followers to surrender at Fort Buford, Dakota Territory, in 1881. These Indians were sent to Fort Yates and eventually they settled at Standing Rock and Grand River.

Transportation

The Missouri River was the artery of commerce for the fur trade of the entire region. Until 1832 the great bulk of the trade goods were moved up the river from St. Louis on keelboats which were poled, rowed, pulled, or sailed up the river depending on the conditions at any particular time and location. The furs and hides received in the trade were returned downstream by the same vessels and by Mackinaws constructed at the posts. The Mackinaw was inexpensive, easy to build, and generally carried a greater cargo than the keelboat, but was good only for downstream travel (Robinson 1966:90; Lass 1962:90-109). Canoes or pirogues, which were essentially canoes with a squared stern, were used for sending messages and small items between posts (Lass 1962:91-94).

A tremendous change in transportation on the Upper Missouri occurred in 1832. After the disasters that befell the Atkinson expedition steamboats in 1819, it was generally assumed that use of such boats was impractical above Council Bluffs. Frustrated by the inability to move merchandise by keelboat in the quantity and with the speed desired, the American Fur Company had for several years considered developing a special craft for the Upper Missouri navigation. Finally construction of a small, broad beamed steamer of shallow draft was commissioned. In 1831 that boat, the Yellowstone, ascended the river as far as Fort Pierre, and in 1832 it reached Fort Union, opening the upper river to comparatively rapid and dependable transportation for the first time.

The steamboat was destined to be the principal means of freight hauling throughout the valley from 1832 until the arrival of the Northern Pacific Railroad at Bismarck in 1873. Although steamboats had little to do with permanent settlement in most of North Dakota, they were a primary factor in the early settlement of the study area because the boats were the primary means of commercial transportation until the arrival of a railroad branch line in 1914.

In 1880, Bismarck reported the arrival and departure of 172 vessels during the summer. This kind of volume prompted many individuals to establish woodyards for fueling the steamboat traffic. In some cases small settlements were established in the vicinity of these fuel depots (Lass 1962:130-136; Williams 1961:187-188).

One such wood merchant, or "woodhawk," was Andy Marsh who started a woodyard in Emmons County in 1872. Marsh also provided a ferry crossing of the river near his woodyard. Another woodhawk, James B. Gayton, came to North Dakota in 1868 and became a commissary clerk at Fort Rice. By 1874 he operated a woodyard in partnership with Andy Marsh. Gayton operated another woodyard below the mouth of Cattail Creek and later one on Horsehead Flat. In 1883 he had a trading store in the latter vicinity and the nearby townsite of Gayton was named for him. Another woodhawk, Mull Huran, ran a woodyard four miles below Fort Rice. Woodhawks apparently sold more than wood. Andy Marsh and Tom Foley were ordered to stop selling whiskey on the east side of the river by Indian Agent Palmer in 1875. They ignored the order, as did the Kelly brothers who were bold enough to set up shop directly across from the agency (History of North Dakota Grazing File n.d.a:6; Weeden n.d.:24, 36; Milligan 1976:26-27).

By 1880, the "Indian problem" had been resolved and the military presence greatly reduced, which correspondingly reduced the highly profitable military trade of the steamboat transportation companies. The Northern Pacific Railroad had completed a line from Duluth, Minnesota to Bismarck, North Dakota on June 3, 1873 and in 1879 began pushing westward (Robinson 1966:127, 184). After 1883, Bismarck was the only port that could readily serve the remaining area not already provided with railroads. In 1885 what had long been the largest shipping company on the Upper Missouri, the Coulson line, quit the business. Thereafter the bulk of boats handling freight belonged to the Fort Benton Transportation Company, an organization owned largely by Fort Benton merchants, incorporated in Iowa, but with operating headquarters in Bismarck (Lass 1962:101-102, 137).

After 1885 the Upper Missouri steamboat trade was mostly of a local nature, with the exception of 1887 when a brief boom occurred that was to be responsible for the end of the steamboat era. This boom was caused by the record breaking construction of the St. Paul, Minneapolis, and Manitoba Railway (soon to become the Great Northern) line from Minot to Great Falls. While the season offered a great deal of work and profits to the steamboat lines hauling construction supplies from Bismarck to points such as Williston and Fort Benton, the completion of the railroad to Great Falls that year marked the finale for long haul steamboat transportation on the upper river (Lass 1962:154-157).

While river and rail travel carried freight and prospectors to major settlements, the overland stage coaches and freight wagons allowed access to those regions not served by boat or train. In 1877 the Northern Pacific Railroad, Minnesota Stage Company, N. P. Clark of St. Cloud, and Peter Steims and his associates formed the Northwestern Express and Transportation Company (known as the E. T. Company) to transport freight and passengers from Bismarck to Deadwood, South Dakota, in the heart of the Black Hills gold fields. This company bought horses, mules and wagons and built quarters for their men along the 210 mile route. The first stages left Bismarck on April 11, 1877. In 1880 the Chicago and Northwestern

Railroad reached Pierre, South Dakota, and the E. T. Company sold out and moved to Pierre (Larson 1931:60).

Other regions, however, did not receive rail service for many years and stage lines were an essential link to trade and communication centers. Daily stages ran from Bismarck to Winona and Fort Yates. Charles Copitz ran this line, and his drivers were John Eastwood and LaBrock. The route was only passable during the dry months. The first stop was five miles south of Bismarck at the small village of Stewartsdale, which included a grain elevator, stockyards and a church. The next stop was Glenco where the stage was ferried across the river to Huff and Fort Rice, then ferried back to Glenco. After the Glenco stop, the stage continued to Livonia where mail was distributed at the Baker post office. The fourth stop was at the Casey post office at Gayton. The remaining stops were at the Hampton and Emmonsburg post offices, with the stage ending the days' journey at Winona. At Winona the stage was ferried across the river to Fort Yates. The following day the route was reversed (Sprunk 1976:8; Oder 1976:24). These stages operated during daylight hours, weather permitting, and changed their routes to adapt to changes in the locations of post offices. The Emmonsburg post office changed its location at least seven times from 1883 to 1934, and the Livonia post office seven times from 1883 to 1942.

The half-way house for a stage line operating between Mandan and Fort Yates was located at the ranch headquarters of Henry S. Parkin. Noted visitors to this stopping place include the Archbishop of Canterbury, Duke Boris of Russia, Major James McLaughlin, Sitting Bull and "Buffalo Bill" Cody. A telegraph station on the line from Fort Yates to Fort Lincoln was also located at the ranch headquarters (Emmons County Record 1939:1; Mattison 1953:177).

Most communities on the river had ferries to allow crossing. The Winona-Fort Yates ferry was operated by Andy Marsh. Marsh lost his license and the ferry crossing was operated by H. M. Douglas in 1884. The following year Marsh regained his license from Douglas. Fred Carrow operated a ferry on Big Beaver Creek until 1884, when H. A. Archambaut took over the operation. John Leach operated a ferry on the Cannonball in 1895. General Land Office survey plats for the 1983 study area indicate ferry landings in Section 7, Township 130 North, Range 79 West in 1881; in Section 10, Township 134 North, Range 79 West in 1886; and in Section 19, Township 138 N, Range 80 West in 1912 (for more specific legal locations, see Appendix B, contained in Volume 2 of this report).

Euroamerican Settlement

The first Euroamerican settlers to the region, other than fur traders, military men and woodhawks, were the open range ranchers. The taming of the Indians, extermination of the buffalo, and the great reduction in the size of the Indian reservations after 1877 opened a tremendous expanse of land to cattle and sheep raising. One of the first ranchers in the project area was Walter S. Parkin who, in partnership with Mandan meat retailer, W. C. Badger, operated the Horsehead Ranch in Emmons County. During the

summer months their cattle fed on the "free range" in Sioux County, then in January were herded across the frozen Missouri River to the Badger-Parkin corral. Here the cattle were protected from the harsh northern winds in the timbered floodplain until March, when they were driven back to Sioux County (History of North Dakota Grazing Files n.d.b:1; Mattison 1953:177; Fristad 1970:47).

Many factors contributed to the influx of homesteads in the early 1880's, commonly called the "Great Dakota Boom." Steamboat and rail transportation had made the area easily accessible, the "Indian problem" had been resolved, and the land was either free or inexpensive. Settlers who selected non-railroad grant lands could homestead on 160 acres for filing and proof fees amounting to \$16.00. The Northern Pacific, which had been given large land grants by the federal government, sold land to settlers at \$2.50 an acre and up. Typically, the sizes of the homesteads were small. The type of structures the settlers constructed varied according to available materials and ethnic preferences. On the timbered river bottoms, log structures were common, while on the rolling plains, structures were built of milled lumber or earth, often banked into a hillside. Where few construction materials were available from nature, lumber was hauled in by railroad and freight wagon (Woods and Wenzel 1976:16).

Early settlements in the area also occurred as a result of the restrictive military laws at the Standing Rock agency. Some of the forty men who had been employed to construct the Standing Rock Agency in 1873 built a colony for themselves east of the Missouri in Emmons County. Shortly thereafter, sixteen houses were built near the Andy Marsh woodyard. The dwellings had antelope hides stretched tight across window frames, doors and split logs, and chimneys constructed of logs plastered with mud. Marsh had a larger building where he put in a stock of whiskey and also provided entertainment for the men. This settlement was soon called Hard Scrabble or Devil's Colony (Weeden n.d.:37-38; Barett 1975:1). As a result of the increased military operation at Fort Yates, in 1884 Devil's Colony was surveyed, platted and renamed Winona (Williams 1961:110). On April 30, 1884, a medical officer at Fort Yates reported (Medical History of Fort Yates 1878-1903: 212):

The steamers from Bismarck have brought with other freight, a good deal of lumber for the new town opposite [the] post. The town has been named 'Winona'. At this date, a large number of claims have been taken in the vicinity of the townsite and all desirable land occupied.

During its heyday, Winona was claimed to be the largest city between Bismarck, North Dakota and Pierre, South Dakota, with two hotels, two stores, two restaurants, nine saloons, a race track, and a post office run by James G. Pitts (Winona Times 1884:4; Barett 1975:1). Winona's reputation as a "fort town" and an offspring of Devil's Colony continued, and in May 1884, the medical officer at Fort Yates complained (Medical History of Fort Yates 1878-1903: 215):

Owing to the ease with which whiskey can be obtained at the new town of Winona opposite the post since pay day 15 inst. ... there have been several desertions from the post during the month.

Towns like Winona were called "hog" or "whiskey ranches" and were the subjects of many complaints by Indian agents and post commanders. Winona had an especially bad reputation for treachery. For example, one man reportedly killed by a saloon girl was buried in the cellar. Although the body was later discovered, no mention was made of its removal or a subsequent investigation (Barett 1975:4). In December 1885, a soldier was accused of killing a woman in the town and was held on a charge of murder. He was later acquitted. On two occasions the bodies of frozen soldiers were found near Winona (Medical History of Fort Yates 1878-1903:Vol.I:164, 258, Vol.II:2). As the population increased and families moved into the town, businesses flourished and crime became less of a problem. In 1885 a newspaper, the Winona Lancet began publication followed in 1887 by the Winona Times. By 1888 a literary club, dramatic club and yearly July 4th celebrations, which included racing horses, provided entertainment for the "cultured" of Winona (Winona Times 1888:1).

In the mid-1880's Emmons County was the scene of a colonization of Hollanders from the Netherlands, Michigan, Illinois, Iowa and New York. Pifer Bakker came to North Dakota as a land agent and promoted the "free lands" which would enable his friends and relatives in the east to become landowners. These settlers founded the town of Hope. Pieter Ellenbroek also contributed to the Hollander settlement in Emmons County. Ellenbroek also worked as a real estate agent for the Chicago, Milwaukee and St. Paul Railroad which advertised the area in "De Volksvriend," a Dutch language newspaper published at Orange City, Iowa. The Chicago, Milwaukee and St. Paul Railroad named two of the area communities with a view toward attracting these settlers: Hauge in Emmons County, and Zeeland in MacIntosh County. By April 1886, the Hollander settlement had grown to two hundred persons and was still expanding (Woods and Wenzel 1976:14; De Jong 1967:256; Strausburg Diamond Jubilee 1976:34).

Ethnic ties were strong and a sense of identity prevailed over the Emmons County community, often called "The Wooden Shoe Settlement." Religion was an important part of this ethnic identity, and the Dutch and Christian Reformed Churches were soon established. Many of the Hollanders reportedly constructed their initial homes and outbuildings of sod (Strausburg Diamond Jubilee 1976:35; De Jong 1967:254).

In the late 1880's and early 1890's German-Russian immigrants began to expand northward from South Dakota into the Emmons County region. These settlers built substantial mud dwellings similar to those they had left in Russia. The mud was mixed with straw, formed into bricks and allowed to bake in the sun. The completed walls of the structure would be plastered with mud, producing a well-insulated building able to withstand the extreme Dakota temperatures (Woods and Wenzel 1976:16; Trinka 1920:188).

Early farmers of the region suffered the hardships of adapting to new environmental, economic and social pressures. Many of the small homesteads could not sustain a family and often these settlers sold their land and moved on to homestead in a less hostile environment. Those settlers who could afford to buy out the less fortunate were able to increase their lands to a supportable level. National economic declines and local climatic disasters in the 1890's dealt crushing blows to many settlers and discouraged would-be settlers from coming to the region (Robinson 1981:15).

In the first decade of the 20th century many of these discouraging elements eased. Railroads began to expand and build branch lines to smaller communities. A new milling process and the creation of an increased food market stimulated by increasing industrialization in the eastern United States favored the grains grown on the northern plains, and encouraging climatic conditions all contributed to a new surge in settlement in North Dakota.

Towns not blessed with railroad service soon experienced a loss of population and commerce. When the military troops withdrew from Fort Yates in 1903, the town of Winona, which was not served by the railroad, gradually declined until 1913 when it was virtually a ghost town. In 1935 the last building in the town was removed. Historic debris, pits, cellar depressions and roads are all that remain there today (Williams 1961:110; Mattison 1954:173).

In the depression years of the 1920's and 1930's drought brought added difficulties to the farmers and ranchers of the region. Land and farm prices reflected the economic difficulties and resulted in many foreclosures on farm mortgages. From 1921 to 1934, approximately one-third of North Dakota families lost their farms through foreclosures (Robinson 1966:400). Improved weather conditions and growing farm size eased many of these difficulties in later years. Although average farm size continues to grow slightly in the region, the rural economy and settlement population have been fairly stable since 1950. The German-Russian and Hollander ethnic groups are still identifiable in Burleigh and Emmons counties although they have been largely assimilated into the mainstream society of the region.

Impact of Oahe Dam

The completion of Oahe Dam and subsequent inundation destroyed an unknown, but presumably large, number of historic resources. The foci of many historic activities relating to the themes of exploration, homesteading, woodhawking and transportation were generally located in areas that are now inundated. Mattison (1953:i-ii) recorded a total of 149 sites in all areas believed to be adversely affected by the completion of the reservoir. These sites were recorded during "seven field trips....Approximately four years of intermittent research, followed by two years of intensive research....on original and secondary materials found in libraries in Washington D.C., Lincoln and Omaha, Nebraska, in Pierre, South Dakota, and Bismarck, North Dakota."

Of the 149 sites recorded, 14 are or were located on the left bank of the river between Bismarck, North Dakota and the South Dakota state line. None of Mattison's (1953) sites were located during the 1983 survey, although one was located during the 1982 Larson-Tibesar Associates' survey (Larson et al. 1983). Seven of these sites are known to be at or below the maximum operating pool level of 1620 feet a.m.s.l. (average mean sea level; Mattison 1953:9-11). The site located in 1982, Winona, was listed by Mattison (1953:9) as being below the maximum operating pool level of the reservoir. A summary of the status of all 14 of the historic sites is presented below:

inundated or destroyed	6
inundated or inundated/not found	2
off survey	2
not found/off survey	2
not found	1
located (1982)	1

All six of the sites listed as inundated or destroyed are Lewis and Clark campsites. These sites may have been destroyed prior to completion of Oahe Dam. It is also questionable whether they could ever have been located based on the presumed low intensity of the occupation and poor locational information.

Based on Mattison's (1953:ii) list of site types we can assume that none of the smaller ranching/farming operations were recorded during his survey. In addition, archeological and ethnohistorical evidence seems to indicate that smaller settlements were not recorded. It is likely that many of these sites did not fit Mattison's criteria as an historical resource. The results of the Document Search (Volume II, Appendix B) completed for this report indicate that at least an additional 40 historic site were inundated. Twelve more are listed as probably inundated. Most of these appear to be of the types not considered by Mattison.

CHAPTER SIX CULTURAL RESOURCES ENCOUNTERED

The descriptions contained in this chapter are intended to be brief summary statements concerning the cultural resources encountered during Larson-Tibesar Associates' 1983 inventory of the Left Bank of Lake Oahe. Only those sites and isolated finds which were substantiated during field inspections are discussed in this chapter. Those sites which have been previously recorded or suggested to exist in the study area, but could not be located, are discussed in Chapter Eight, Study Area Evaluations, and also in Appendix B of Volume II, Documents Search.

The following discussions also contain brief statements, on a site-by-site basis, of National Register of Historic Places eligibility and recommendations for any further work believed necessary. It should be noted that none of the isolated finds recorded are believed to be eligible for nomination to the National Register of Historic Places. More explicit recommendations for the cultural resources which are believed to be eligible for nomination to the National Register of Historic Places are given in Chapter Nine, Conclusions and Recommendations.

The descriptions have been partitioned into groups by the township and the range in which they occur. Within these groups the sites are listed in sequential order by their Smithsonian trinomial system site numbers. These are followed by descriptions of any isolated finds which occur in the group. In order to make it easier to find an individual description within this chapter, Table 6.1 presents an ordered listing, sorted by the ascending order of the site numbers, by county, and giving by the page number where the description begins. The table concludes with a similar listing for isolated finds.

Many of the diagnostic artifacts collected during this study are discussed and illustrated in the following pages. A complete listing and description of all artifacts collected during the study is presented in Appendix D, Volume III. Volumes III and IV are composed of site report forms containing further information on each recorded locale including maps, map legends and photos. Readers interested in more detailed information on individual properties are referred to those documents.

Township 129 North, Range 78 West

32EM364

This site consists of a large and deep depression and the remains of a wood frame structure of unknown function. No artifacts other than milled lumber were observed on the site. The site may be the remains of the

Table 6.1. Cross reference chart for sites and isolated finds described in Chapter Six.

<u>Sites</u>		
Number	Township/RANGE	Page
<u>BURLEIGH COUNTY SITES</u>		
32BL1	Township 137 North, Range 79 West	99
32BL5	Township 137 North, Range 80 West	100
32BL46	Township 137 North, Range 80 West	103
32BL47	Township 137 North, Range 80 West	103
32BL48	Township 137 North, Range 80 West	104
32BL49	Township 137 North, Range 79 West	99
32BL50	Township 137 North, Range 80 West	104
32BL51	Township 137 North, Range 80 West	104
32BL52	Township 137 North, Range 79 West	100
<u>EMMONS COUNTY SITES</u>		
32EM1	Township 129 North, Range 79 West	54
32EM6	Township 133 North, Range 79 West	69
32EM7	Township 134 North, Range 79 West	76
32EM10	Township 136 North, Range 78 West	89
32EM11	Township 136 North, Range 79 West	95
32EM19	Township 134 North, Range 79 West	78
32EM21	Township 134 North, Range 79 West	78
32EM30	Township 134 North, Range 79 West	79
32EM73	Township 130 North, Range 79 West	61
32EM77	Township 136 North, Range 79 West	95
32EM78	Township 136 North, Range 79 West	96
32EM79	Township 136 North, Range 79 West	96
32EM80	Township 136 North, Range 78 West	90
32EM81	Township 136 North, Range 78 West	92
32EM82	Township 136 North, Range 78 West	92
32EM83	Township 136 North, Range 78 West	92
32EM84	Township 136 North, Range 79 West	98
32EM85	Township 136 North, Range 78 West	93
32EM86	Township 136 North, Range 78 West	93
32EM87	Township 136 North, Range 78 West	94
32EM88	Township 135 North, Range 78 West	85
32EM89	Township 135 North, Range 79 West	87
32EM90	Township 135 North, Range 79 West	87
32EM91	Township 136 North, Range 78 West	94
32EM92	Township 135 North, Range 79 West	89
32EM93	Township 134 North, Range 79 West	81
32EM94	Township 134 North, Range 79 West	81
32EM95	Township 134 North, Range 79 West	82
32EM96	Township 134 North, Range 79 West	82
32EM97	Township 134 North, Range 79 West	82
32EM98	Township 134 North, Range 79 West	83
32EM99	Township 134 North, Range 79 West	84
32EM100	Township 134 North, Range 79 West	84
32EM101	Township 130 North, Range 79 West	63
32EM109	Township 133 North, Range 79 West	70
32EM110	Township 133 North, Range 79 West	71

Table 6.1 (cont.). Cross reference chart for sites and isolated finds described in Chapter Six.

Number	Township/Range	Page
<u>EMMONS COUNTY SITES (cont.)</u>		
32EM111	Township 133 North, Range 79 West	71
32EM112	Township 133 North, Range 79 West	72
32EM113	Township 133 North, Range 79 West	74
32EM114	Township 133 North, Range 79 West	74
32EM115	Township 133 North, Range 79 West	75
32EM116	Township 133 North, Range 79 West	75
32EM117	Township 133 North, Range 79 West	75
32EM118	Township 133 North, Range 79 West	76
32EM119	Township 132 North, Range 79 West	68
32EM120	Township 132 North, Range 79 West	68
32EM121	Township 132 North, Range 79 West	69
32EM122	Township 131 North, Range 79 West	66
32EM123	Township 131 North, Range 79 West	68
32EM124	Township 130 North, Range 79 West	63
32EM125	Township 130 North, Range 79 West	64
32EM126	Township 136 North, Range 79 West	98
32EM202	Township 135 North, Range 78 West	86
32EM203	Township 135 North, Range 78 West	86
32EM353	Township 130 North, Range 79 West	64
32EM354	Township 130 North, Range 79 West	64
32EM357	Township 129 North, Range 79 West	56
32EM360	Township 129 North, Range 79 West	56
32EM362	Township 129 North, Range 79 West	59
32EM363	Township 129 North, Range 79 West	59
32EM364	Township 129 North, Range 78 West	50
32EM366	Township 129 North, Range 78 West	54
32EM368	Township 129 North, Range 78 West	54
<u>ISOLATED FINDS</u>		
CRMOAHE-1	Township 137 North, Range 80 West	105
CRMOAHE-2	Township 129 North, Range 79 West	61
LTA1383-5	Township 132 North, Range 79 West	69
LTA1383-6	Township 132 North, Range 79 West	69
LTA1383-10	Township 129 North, Range 79 West	61
LTA1383-11	Township 130 North, Range 79 West	66
LTA1383-12	Township 130 North, Range 79 West	66
LTA1383-13	Township 129 North, Range 79 West	61
LTA1383-14	Township 129 North, Range 79 West	61
LTA1383-15	Township 130 North, Range 79 West	66
LTA1383-16	Township 130 North, Range 79 West	66
LTA1383-17	Township 132 North, Range 79 West	69
LTA1383-506	Township 133 North, Range 78 West	76
LTA1383-509	Township 133 North, Range 78 West	76
LTA1383-603	Township 134 North, Range 79 West	85
LTA1383-604	Township 134 North, Range 79 West	85
LTA1383-605	Township 134 North, Range 79 West	85
LTA1383-607	Township 134 North, Range 79 West	85
LTA1383-608	Township 134 North, Range 79 West	85
LTA1383-609	Township 134 North, Range 79 West	85

Table 6.1 (cont.). Cross reference chart for sites and isolated finds described in Chapter Six.

Number	Township/Range	Page
<u>Isolated Finds (cont.)</u>		
LTA1383-610	Township 134 North, Range 79 West	85
LTA1383-611	Township 135 North, Range 79 West	89
LTA1383-612	Township 135 North, Range 79 West	89

1

homestead of John Manning, who claimed the property in 1884 and received patent in 1889.

The site retains low integrity. Some of the site may have been inundated by Lake Oahe and other parts may have been plowed. The site does not appear likely to yield important cultural information. None of the persons associated with the title history of the property appears to have been important in local, state or national history, and archival sources do not indicate other possible historical significance in the site. This site is therefore not believed to be eligible for nomination to the National Register of Historic Places and no further research is recommended.

32EM366

Three shallow man-made depressions with no associated artifacts or structural materials were encountered at this site. The exact origin and function of this site are unknown.

Integrity is very low. Although the ground cover was very light, no artifacts were discovered on the site. None of the persons associated with the title history of the property appears to have been important in local, state or national history, and archival sources do not indicate other possible historical significance for the site. This site is therefore not believed to be eligible for nomination to the National Register of Historic Places and no further research is recommended.

32EM368

A refuse scatter was found at this locality. The materials within the scatter include whiteware shards, two metal buckets, fenceposts, sheet metal, patinated green glass, rubber tires, and several pieces of horse-drawn farm machinery. This site was apparently a general dump for the farmstead located nearby on private land. The artifact scatter is very sparse except at the west end of the site, where non-domestic items predominate.

A considerable portion of this site has eroded into Lake Oahe. The integrity of this site is therefore very low and it does not appear likely to yield important cultural information. None of the persons associated with the title history appears to have been particularly important in local, state, or national history, and archival sources do not indicate other possible historical significance for the site. This site is therefore not believed to be eligible for nomination to the National Register of Historic Places and no further research is recommended.

Township 129 North, Range 79 West

32EM1, the Havens site

The Havens site and the excavations conducted at it are described by Sperry (1982). It is a large, unfortified village assessed as belonging to

1

the Fort Yates phase of the Extended Middle Missouri variant. Radiocarbon dates for the site yielded a mean date of A.D. 1225 ± 71 (Sperry 1982:139). Various segments of Sperry's (1982) report summarize the site:

The site had never been cultivated and at the time of excavation was in native prairie sod. Depressions marking the locations of 56 long-rectangular houses were present over an area of about 15 acres on the second terrace of the Missouri River which was from 20 to 25 feet above the existing flood plain. The site occupied this rolling terrace, a sloping hillside rising to the east, and a second relatively level area at a higher elevation. Elevational differences within the site ranged between 1600 and 1650 feet above sea level. On the southern limits of the site was a timbered coulee with a deeply entrenched intermittent stream which joined the Missouri River. The pre-reservoir channel of the Missouri River was 3/4 of a mile to the west. The land to the east rises from the river valley in a series of high hills to a maximum elevation of 1900 feet.

The houses within the village were oriented on a northeast/southwest axis with entrances opening to the southwest. Although the placement of the houses tended to be in rows, rank and file, this arrangement was not regular. The houses were spaced widely apart. Depressions ranged from 35 to 69 feet long, from 27 to 44 feet wide, and from 1 to 3 feet deep. One unusually large depression 94 feet long, 47 feet wide, and 6 feet deep was on a high point of ground in the southern corner of the site....No indications of fortifications were visible.

Midden deposits were spread over the entire surface of the site and were particularly heavy in the area around and west of House 2. Deposits overlying sterile soil ranged from 0.5 to 1.8 feet deep. Midden debris was encountered directly below the sod zone and no sterile overburden was noted in any areas tested [pp. 4-5].

Archeological investigations were limited to the lower levels of the site which were first subjected to inundation and wave action. Due to the width of the reservoir at this point and the direction of the prevailing winds against the site, wave action and bank slippage were predicted to cause considerable destruction beyond the maximum line of inundation. Considerable erosion was noted between the 1967 and 1968 field seasons and continues to present [p. 8].

Settlement pattern, architecture, ceramics and overall artifact complex similarities lead to proposed assignment of the Havens site to the Fort Yates Phase of the Extended Middle Missouri Variant of the Middle Missouri Tradition. The number of houses at the site and the presence of artifacts such as the L-shaped antler haft and ridged axe which appear to be late Extended Variant arrivals in the area suggest occupancy during the upper end of the time range. However, the two dates of A.D. 1217 ± 77 indicate an earlier occupation. At present, neither the single radiocarbon sample dates nor the singular presence of the two artifacts seem strong enough evidence by themselves to place the site

temporally. In light of the trend toward larger villages shown by Tony Glas and Terminal Middle Missouri sites with large concentrated populations, it seems likely that the size of the Havens site may also be due to this trend. If such is the case, Havens probably represents a late manifestation of the Fort Yates Phase, although the frequencies of Riggs and Fort Yates ware found at the site correlate very closely with those present at Bendish and Paul Brave which have dates of 1253 ± 69 and 1070 ± 77 respectively [p. 153].

While only a small sample was collected in 1983, the materials which were observed at the Havens site compare favorably with the known site assemblage (Sperry 1982). The intact portions of the site are in a very good state of preservation. However, bank erosion has destroyed another one-third of the site since the Sperry map was made and pot hunting in the bank is extremely heavy (Figure 6.1). The Havens site is believed to be eligible for nomination to the National Register of Historic Places due to its physical integrity and its ability to contribute further information to our understanding of the Middle Missouri tradition.

32EM357

Prehistoric cultural material at this site extends from the base of a cutbank to the water's edge. The material has been sorted into ribbons of concentrations parallel to the water. No material was found in the cutbank. Topography above the beach is rolling hills and slopes. The site is on a rounded point extending out into the reservoir and cultural materials likely extend for some distance underwater.

The majority of the material observed consists of large quantities of small bone fragments and some identifiable bison long bones. There are also a large number of body sherds, mostly plain and simple-stamped, but some with cord impression. Lithic materials are predominantly Knife River flint and gray Tongue River silicified sediment. Five rim sherds were mapped and collected. A general surface collection yielded another five rim sherds, nine body sherds and one gray Tongue River silicified sediment projectile point. The projectile point (Figure 6.2a) is a Late Prehistoric period corner notched variety. Those rim sherds which are identifiable appear to be Riggs Ware, specifically Riggs Plain (Figure 6.2b), Riggs Punctate (Figure 6.2c), or Riggs Decorated Lip (Figure 6.2d).

The site has poor physical integrity. Apparently all the cultural material is eroded and redeposited on the beach. No features are visible. Much of the material has been mixed and sorted by wave action. This site is not believed to be eligible for nomination to the National Register of Historic Places due to its lack of physical integrity and the fact that no further significant information can be gathered from it.

32EM360

This site contains at least two large fieldstone foundations, a concrete block foundation, a portion of a concrete block wall, several cellar

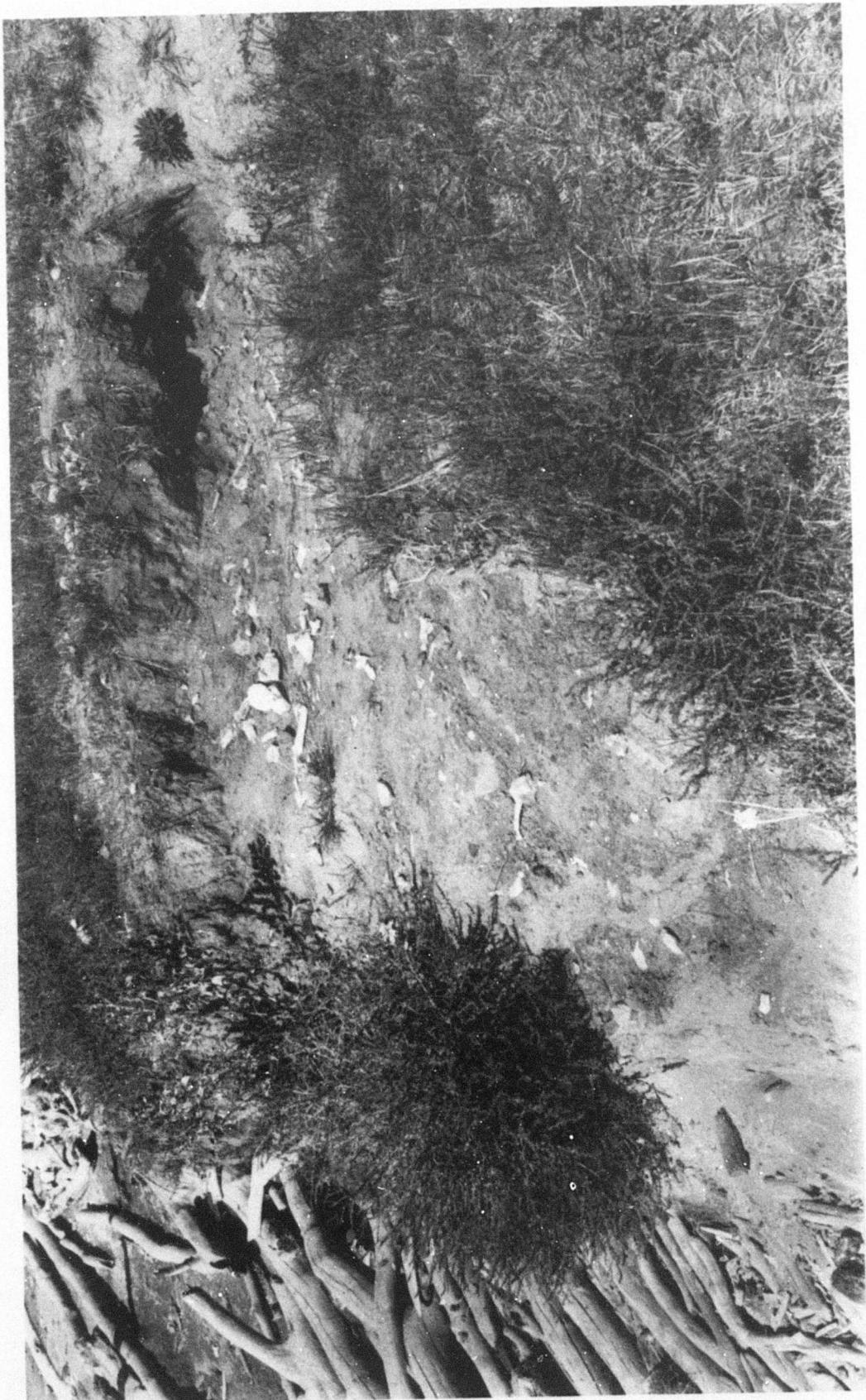


Figure 6.1. Area of vandalism at 32EM1.

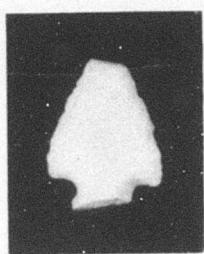
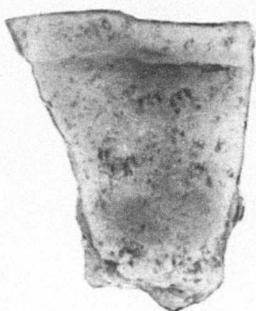
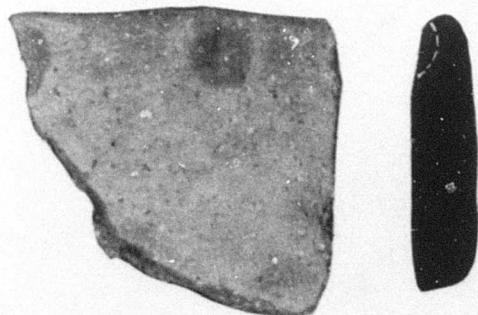
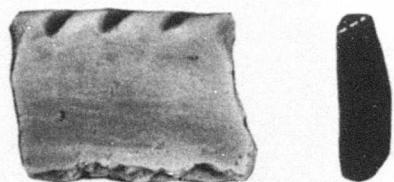
**a****b****c****d**

Figure 6.2. Diagnostic artifacts from 32EM357.

depressions, an auto body, a metal stock tank, and a scatter of post-1920 cans, glass and barbed wire. It appears to be a farmstead which started as a homestead and expanded to a very large ranching operation. Physical remains indicate that the site was abandoned after 1950, possibly at the time a part of the site was taken by the United States Government for the Oahe Reservoir.

This site retains fair integrity; all buildings have been removed but ground surface does not appear to have been disturbed after abandonment. The site exhibits no outstanding characteristics, however, and no particular likelihood to yield important cultural information. None of the persons associated with the title history of the property appears to have been particularly important in local, state or national history, and archival sources do not indicate other possible historical significance for the site. This site is therefore not believed to be eligible for nomination to the National Register of Historic Places and no further research is recommended at this time.

32EM362

This is the homestead of Leonard Edward Johnson, who received patent in 1920, but who was resident on the site as early as 1916 according to the Ogle Atlas of Emmons County of that year. The site contains a large number of domestic artifacts both on the surface and slightly buried in the mound around one depression. The structure on the depression may have been a dwelling with sod or earthen roof, which slumped off the roof to form the mound. The site is not in any apparent danger, and most of the site may be on private property. None of the owners of the site were particularly important in local, state or national history.

The eligibility of this site for nomination to the National Register of Historic Places is unknown. While archival sources do not indicate any particular historical significance for the site, it may have some research potential as an archeological site. Testing or excavation should not be undertaken, however, until research questions and goals are defined for such settlement sites. Until that time, the site may be adequately managed by avoidance of impacts.

32EM363

An abandoned farmstead containing a two-pen log dwelling (Figure 6.3), ruins of another log structure, milled lumber remains of a third structure, two car bodies, and an extensive scatter of glass, crockery, plastic, rubber, leather and various metal was recorded at this site. This is the homestead of Patrick Kinsella who received a Homestead Act patent for the property in 1890. The domicile is noted as "DSBJ Land Co." on the 1916 Ogle Atlas of Emmons County.

The nature and construction techniques indicate that the buildings may be the original homestead structures. The construction technique for the gable ends and the wall treatments are interesting, but are not of sufficient gravity to sustain a National Register of Historic Places nomination. A portion of the site has been plowed, and the southern edge has apparently



Figure 6.3. Log building at 32EM363.

eroded into Lake Oahe.

None of the persons associated with the title history appears to have been particularly important in local, state or national history, and archival sources do not indicate other possible historical significance for the site. This site is therefore not believed to be eligible for nomination to the National Register of Historic Places and no further research is recommended.

IF LTA1383-10

This isolated find is a handmade, iron projectile point (Figure 6.4a). Although its age is unknown, it is presumed to date from the historic era.

IF LTA1383-13

This artifact is a secondary Knife River flint flake, size grade 3 (i.e., greater than or equal to one-half inch but less than one inch in size).

IF CRMOAHE-2

This isolated find is a portion of a wooden hay rack and pieces of a two-bottom plow.

IF LTA1383-14

This isolated find is a utilized flake of Knife River flint.

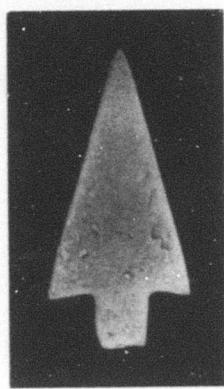
Township 130 North, Range 79 West

32EM73

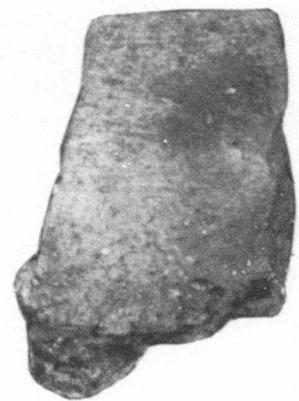
The original site form for 32EM73 was filled out during a 1982 cultural resource inventory by Larson-Tibesar Associates (Larson et al. 1983). However, the site was outside of the inventory boundaries for that project and it was not discussed within the project report.

As originally recorded, 32EM73 consisted of small pieces of undiagnostic bone, two Tongue River Silicified sediment flakes, and a fire hearth all exposed in the cutbank of Lake Oahe approximately 21 centimeters below the present ground surface. The hearth consisted of a bowl-shaped red oxidized zone. Small pieces of burned and unburned bone were present within and just above the hearth.

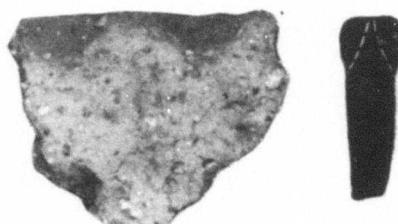
The site was again visited during the 1983 inventory. Cultural material in the cutbank exposure still extends for approximately 33 meters but the hearth has completely eroded. It is believed that approximately 25 percent of the site has eroded since it was recorded in 1982.



a



b



c



d

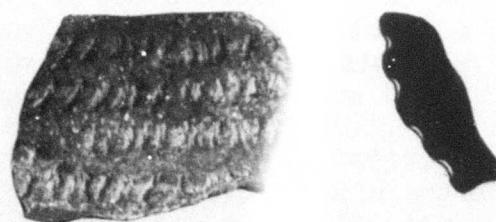


Figure 6.4. Diagnostic artifacts from IF LTA1383-10 (a) and 32EM101 (b-e).

The significance of this site is presently unknown. National Register of Historic Places eligibility can be determined only when the age, content and integrity of the deposits is examined through testing.

32EM101

The original site form for this site was completed by Ralph Thompson on November 15, 1969. He describes it as "village debris on shoreline" (State Historical Society of North Dakota (SHSND) site files). In addition to aboriginal artifactual material, Mr. Thompson noted a glass seed bead. He also noted possible lodge depressions at the site. These depressions were not observed in 1983.

The site is located on the first terrace above the Missouri River at a point where the river bends from northeast to south. Most of the cultural material was found on the eroded beach of Lake Oahe. Two hearths were located in the cutbank. One possible cache pit containing charcoal, bone fragments, flakes and ceramics was also observed in the cutbank. Flakes, bone, fire-cracked rock and a crude biface were found on top of the terrace in an eroded area approximately 15 meters behind the bank edge. It seems likely that undisturbed cultural materials are present in this portion of the site.

Most rim sherds examined from 32EM101 appear to be Middle Missouri tradition wares including Riggs Plain (Figure 6.4b), Riggs Pinched (Figure 6.4c), and Fort Yates Incised (Figure 6.4d). One thick rim sherd with cord-wrapped stick impressions (Figure 6.4e) is quite different from the rest of the assemblage and is believed to be related to the Plains Woodland tradition.

A major portion of this site appears to have eroded into Lake Oahe. However, the presence of cultural material on the terrace above the cutbank, as well as in place in the cutbank, indicates that undisturbed buried cultural deposits are still present at the site. This site may yield information important to the understanding of Middle Missouri prehistory. Testing of 32EM101 will be necessary to determine its extent and eligibility for nomination to the National Register of Historic Places.

32EM124

Site 32EM124 is probably a former farmstead which now contains four depressions and one observed piece of farm machinery. This site may be the remains of the homestead of Henry C. Pratt who received patent to the property on June 29, 1891. None of the persons associated with the title history of the site appear to have been particularly important in local, state or national history, and archival sources do not indicate other possible historical significance for the site.

The site appears to be intact but it has exhibited no indication that it is particularly valuable for the purposes of archeological investigation. The site is therefore not believed to be eligible for nomination to the National Register of Historic Places and no further research is recommended.

32EM125

This site is a light scatter of prehistoric material on the beach of Lake Oahe. The scatter extends along a northwest to southeast oriented beach for approximately 100 meters. At the time of the 1983 inventory there were only approximately 15 meters of beach between the cutbank and the water. The locale was apparently once the zone of contact between the river bottoms and the valley edge. At present, the site area slopes gently to the northeast for approximately 350 meters. No cultural material was noted eroding out of the cutbank. The scatter consists of fire-cracked rock, bone, body sherds and flakes of Knife River flint and gray Tongue River silicified sediment.

The integrity of the site is presently unknown. It seems possible that buried deposits are present within the cutbank (approximately one meter in height) and on the beach itself. If more diagnostic cultural material can be found and collected, the site has a potential to yield significant data concerning the prehistory of the Middle Missouri subarea. From the small collection made at the site, the ceramics appear to be of an unusual type; uncommon to North Dakota. It is recommended the site be revisited in the future for further controlled surface collection and subsurface testing.

32EM353

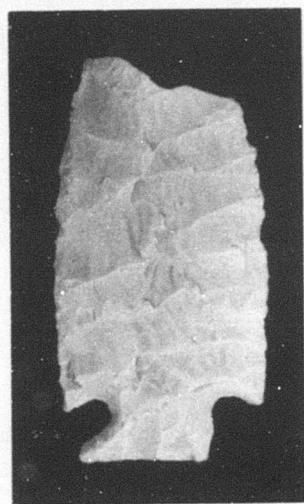
This site consists of a series of poured concrete foundations and a deep rectangular poured concrete structure which may be a dipping tank for livestock. The site is apparently a special activity area for handling livestock and does not appear to contain significant cultural information.

The integrity of this site is low; all structures have been removed and the foundations are crumbling. None of the persons associated with the title history appears to have been particularly important in local, state or national history, and archival sources do not indicate other possible historical significance for the site. This site is therefore not believed to be eligible for nomination to the National Register of Historic Places and no further research is recommended.

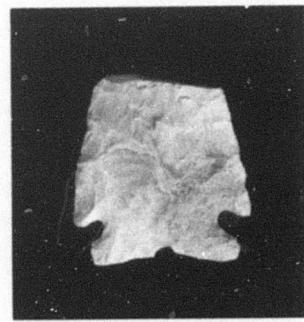
32EM354

The cultural material from this site is located on the eroded beach of Lake Oahe. Prior to erosion, the site appears to have been located on the first terrace above the river. Cultural material is eroding from a clay level exposed at the base of the cutbank. Two features are visible on the beach. One is a concentration of fire-cracked rock and the other is a small charcoal stain. Besides the two features noted above, gray Tongue River silicified sediment flakes, two Tongue River silicified sediment core fragments, Knife River flint flakes, three projectile points and three end scrapers were observed.

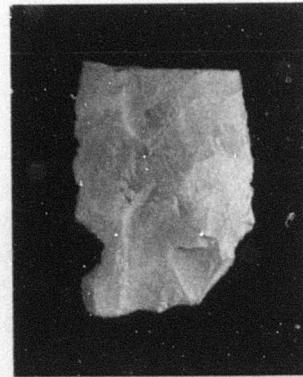
One of the projectile points (Figure 6.5a) is believed to be Besant while another (Figure 6.5b) is a large, side and basally notched specimen,



a



b



c

Figure 6.5. Diagnostic artifacts from 32EM354 (a,b) and IF LTA1383-11 (c).

possibly dating from the Late Plains Archaic period.

Most of the site appears to have been destroyed by wave action but there is a possibility of undisturbed buried cultural materials at the base of the cutbank and inland from it. The projectile points recovered indicate the possibility of an Archaic and perhaps a Late Prehistoric component at the site. This and the possibility of undisturbed material makes the site potentially significant and worthy of further work. Hand testing and mechanical testing are recommended to determine the nature and extent of buried deposits.

IF LTA1383-11

This isolated find (Figure 6.5c) is the basal fragment of a large, side notched projectile point or biface. The artifact is made of Knife River flint. Although fragmented, this projectile point appears to be from the Early Plains Archaic period.

IF LTA1383-12

This item is a tertiary flake of Knife River flint. The size of this artifact was not recorded.

IF LTA1383-15

The artifact found at this location is a secondary flake of Knife River flint, size grade 3 (i.e., greater than or equal to one-half inch but less than one inch in size).

IF LTA1383-16

This is a tertiary flake of Knife River flint, size grade 3 (i.e., greater than or equal to one-half inch but less than one inch in size).

Township 131 North, Range 79 West

32EM122

This site is an abandoned farmstead which now includes a wood frame gabled dwelling converted into a stable, a wood frame gabled lambing barn with large ventilator shaft (Figure 6.6), a wood frame outhouse, a burned area that may have been a barn or corral, the concrete foundation of a dwelling, a root cellar, and a large scatter of domestic artifacts.

This is the farmstead of George S. Nelson, which appears on the 1916 Ogle atlas in this location. Other than the interesting form of the lambing barn, this site does not exhibit outstanding architectural or other physical features and does not appear likely to yield important cultural information. The main dwelling and some other buildings have been removed but the site area has not been otherwise disturbed.

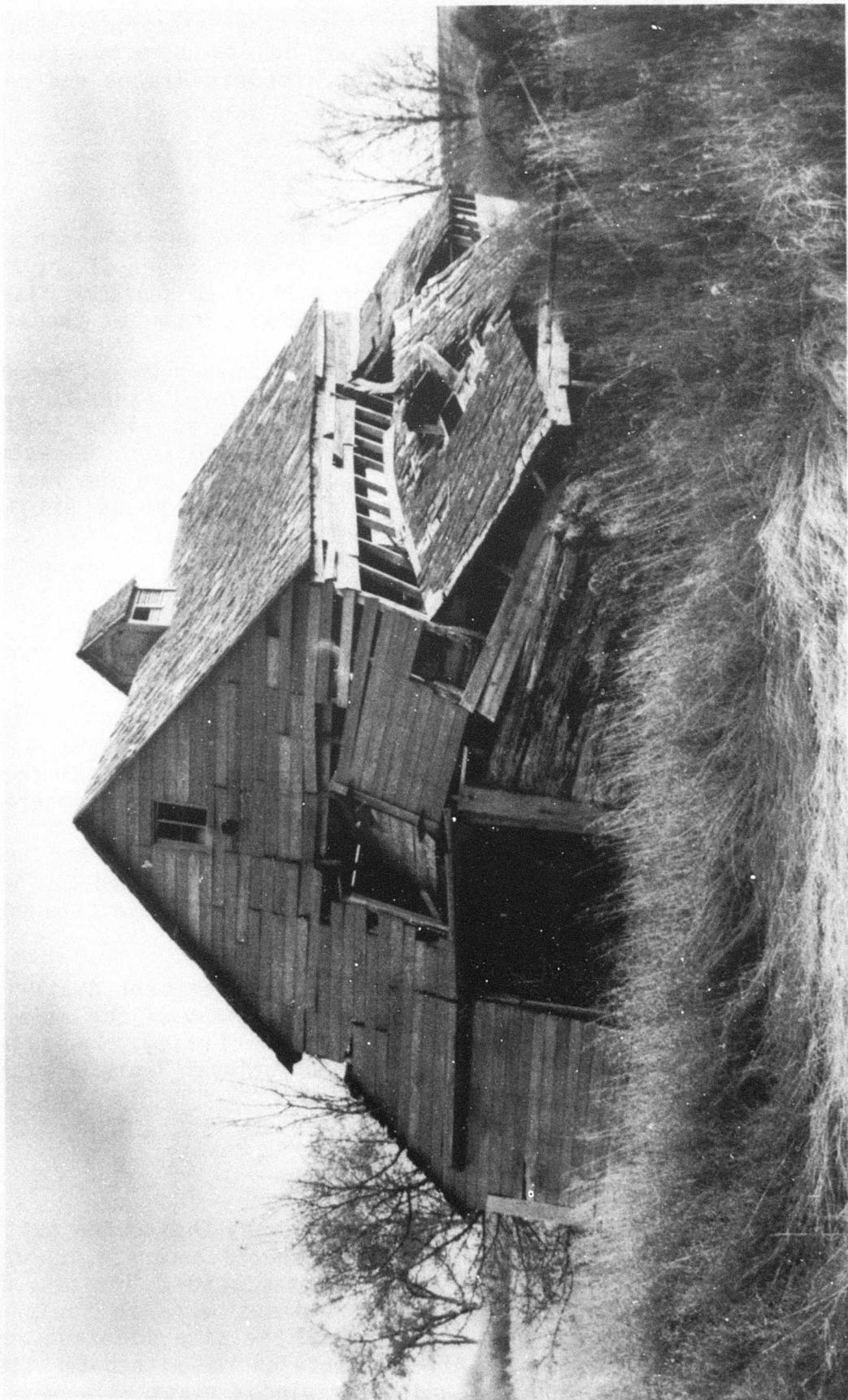


Figure 6.6. Wooden barn at 32EM122.

None of the persons associated with the title history of the site appears to have been particularly important in local, state or national history, and archival sources do not indicate other historical significance for the site. This site is therefore not believed to be eligible for nomination to the National Register of Historic Places and no further research is recommended.

32EM123

Site 32EM123 is a small lithic scatter located on the north side of a deep valley on a point which overlooks a tributary creek of the Missouri River (Lake Oahe). Two gray Tongue River silicified sediment flakes, one Knife River flint flake, and four agate flakes were found at the site.

The site appears to be undisturbed but may have been collected at one time or another due to its close proximity to several ranch buildings on private land. The site is not believed likely to yield information important to understanding the prehistory of the region. Because of the very limited possibility of buried cultural deposits and the fact that no tools were found at the site, it is not believed to be eligible for nomination to the National Register of Historic Places.

Township 132 North, Range 79 West

32EM119

This site consists of a very concentrated scatter of lithics within and a few meters on either side of a two-track trail. The site is located in very loose sand and appears to be entirely deflated and on the surface.

Two, one by one meter sample units were laid out in the trail and materials were counted within each. The first unit yielded 21 flakes and the second two flakes. One Late Prehistoric period projectile point was collected.

Physical integrity of the site is poor. It has been disturbed to a high degree by road activity and wind erosion. Many of the materials in the road appear to have been broken by vehicle activity. The site is not believed to be eligible for nomination to the National Register of Historic Places due to the lack of physical integrity.

32EM120

This site appears to be the remains of a very short term settlement. The site now contains three depressions, a poured concrete foundation or structure, a frame outhouse, and an artifact scatter. The 1947 Corps of Engineers Map No. 125 indicates the buildings were in their present location as early as that year. The sod on the site does not appear to have been extensively disturbed. All artifacts on the site date after 1930, and include modern cans, bottles, and clear window glass.

The site does not appear to have direct association with the operation of the William Macnider ranch, which included this property. Macnider's home ranch apparently was at the mouth of Beaver Creek (Woods and Wenzel 1976:135).

This site exhibits no likelihood to yield important cultural information, and archival sources do not suggest other historical significance for the site. This site is therefore not believed to be eligible for nomination to the National Register and no further research is recommended.

32EM121

This site consists of a large cellar depression, a second rectangular depression, and a scatter of glass and crockery. The site has low integrity; much of the site having been eroded into Lake Oahe.

The site was probably occupied between 1885, when it was sold by the Northern Pacific Railroad to M.J. Treacy, and 1925 when it was sold at sheriff's auction to Frank Chesrown. Chesrown had a large ranch headquartered in Horsehead Valley (Woods and Wenzel 1976:118). None of the other persons associated with the title history of the site appears to have been particularly important in history, and archival sources do not indicate other historical significance for the site. This site is therefore not believed to be eligible for nomination to the National Register of Historic Places and no further research is recommended.

IF LTA1383-5

This isolated find is a secondary Knife River flint flake, size grade 3 (i.e., greater than or equal to one-half inch but less than one inch in size).

IF LTA1383-6

This item is a secondary Knife River flint flake, size grade 3 (i.e., greater than or equal to one-half inch but less than one inch in size).

IF LTA1383-17

This artifact is a tertiary flake of Knife River flint, size grade 2 (i.e., greater than or equal to one-quarter inch but less than one-half inch in size).

Township 133 North, Range 78 West

32EM6, the Horsehead Creek site

The original River Basin Survey site form for this site was completed by George Metcalf on December 13, 1950. That report places the site on the

right (north) side of Horsehead Creek, with ranch buildings covering the site. The present location is believed to be the southern and only remaining segment of the same site. No prehistoric materials were discovered in the areas north of Horsehead Creek, where historic material is still above water (see site description for 32EM109, below).

Both Will and Hecker (1944) and Metcalf observed a large amount of material at the site, probably covering a large area. Will and Hecker (1944:77) describe the site as follows:

A Probable Site (Horsehead Creek)...An unusual amount of evidence of Indian occupation shows at this place. Potsherds, artifacts, bones, burnt stones and flint spalls show along the terrace edge of both the creek and river. The soil is light, subject to wind erosion and the area has been under cultivation and is covered by ranch buildings.

The majority of the site appears to have been exposed to erosion and is now inundated or on the beach. There are some undisturbed buried deposits, however, and this may represent as many as three cultural levels. Cultural material appears to be eroding out of three levels: 30-60 cm below the surface on the south side of a small drainage; 10-50 cm below the surface on the north side of the same drainage; and 120 cm below the surface at various places in the site area. Material observed at the site included body sherds, bird bone, bison bone and lithic debitage. The significance of 32EM6 is unknown at this time. Testing will be necessary to determine the amount of site which remains intact and to determine the deposits' ages and condition.

32EM109

This site consists of the remains of a large ranch headquarters, including several concrete foundations, a silage pit now used as a refuse dump, remains of a granary roof, and domestic and farming artifacts. This is the site of the Badger Ranch, founded by William C. Badger in the late 1870's and one of the largest ranches ever operated in the area. Badger operated in partnership with H.S. Parkins, whose home ranch was near the mouth of the Cannonball River, across the Missouri to the west of the Badger Ranch (Crawford 1931: 508):

H.S. Parkins and W.C. Badger in 1878 brought from Minnesota the first band of cattle to a ranch home in Emmons County. W.C. Badger was a son of Captain Badger of the Sixth Infantry, the last quartermaster at Fort Rice, who carried out the orders to abandon the property in 1878.

Parkins had been a trader at Standing Rock Agency before establishing his ranch on the Cannonball River in the early 1880's (Hennessy 1910: 247-248).

The present site may not have been the original site of the Badger Ranch, however. Badger did not gain title to the property until 1897, and an 1887 General Land Office survey plat indicates a "Badger" establishment at another locality.

Whatever the history of the present site, it is currently in very poor condition due to repeated and prolonged inundation by the waters of Lake Oahe. Most of the observed features are heavily silted-in and have collapsed or been crushed by ice and water pressure. The southern portion of the site is actively eroding into Lake Oahe, and nearly all of the site is below the high water level of the lake. This site is therefore not believed to be eligible for nomination to the National Register of Historic Places and it is beyond preservation or conservation. The cultural values of the site which may be preserved are primarily the recollections of local informants about the site, which should be collected through recorded oral interviews.

32EM110

Site 32EM110 is an historic occupation site which now presently contains five distinct depressions and a raised rectangular area which may have been a barn or corral. This site may be the domicile site of Lorenzo D. Small, who bought the land from the Northern Pacific Railroad in 1887. The property was originally part of the land grant of the railroad. In 1897, Small sold the property to W.C. Badger, and thereafter the title history of the site is the same as for the Badger Ranch nearby (32EM109).

Considering the nature and condition of the site, the present location may have been occupied only between 1887 and 1897. Later co-owners (W.C. Badger and W.S. Parkin) were very prominent area ranchers, but their importance apparently did not arise directly from this site.

This site has fair integrity; all structures have been removed but there is no evidence of disturbance except one recent apparent scoop shovel excavation in the raised area. None of the other persons associated with the title history of the property appears to have been particularly important in local, state or national history, and archival sources do not indicate other possible historical significance for the site. Despite the seemingly good archeological integrity of this site, it does not appear to have enough historical or other cultural importance to be eligible for nomination to the National Register of Historic Places. No further research is recommended for this site.

32EM111

This site designation consists of three concentrations of historic artifacts and farm machinery including canning jars, a horse-drawn wagon and plow, and a collapsed frame outhouse. This site is part of the Frank Chesrown ranch headquarters, most of which is located on private land. It is unknown if the occupied ranch buildings to the immediate east of the site designation are on the original location, but the 1947 Army Corps of Engineers Map No. 126A does indicate the buildings were in their present location at least as early as that year and Frank Chesrown is shown as occupying this approximate location in a 1916 atlas.

The property was also owned by John McCrory, who first came to the region as a soldier in Sibley's Expedition of 1863. In 1877 he came to Fort Yates and established a dairy farm. In 1878 he crossed the river and

established a beef cattle ranch which eventually comprised 15 quarter sections of land (Woods and Wenzel 1976:118).

The portion of the remaining ranchstead which is on Corps property can not be considered to retain integrity and therefore is not believed to be a contributing portion of a potentially eligible site. The portions of the ranchstead remaining on private land may be significant and appear to be in danger due to erosion of the high lake banks.

32EM112 (Historic component)

A former farmstead with seven concrete foundations, at least three wells, a large iron vat mounted on a concrete firebox, and various modern refuse was recorded at this locale. This is apparently the homestead site of William Wade, who came to the area as a laborer working on contract hay and wood crews for Fort Yates (Crawford 1931:509):

Wade settled on the Horse Head bottoms in Emmons County. After a short residence there he moved to a new ranch location on the Cannon Ball...

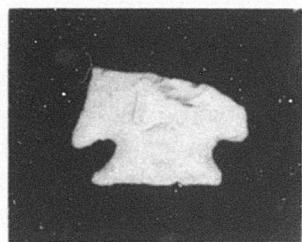
Wade sold the present property in 1892, and in 1894 it was sold again to John McCrory. McCrory developed a large ranch from the present headquarters (Woods and Wenzel 1976:138; 1916 Ogle Atlas).

The present site contains good quality concrete foundations. The 1947 Corps of Engineers Map No. 125 indicates the presence of a building at this site location. The site does not appear to contain artifacts predating 1940, and does not appear especially likely to yield important cultural materials. None of the other persons associated with the title history of the site appears to have been particularly important in local, state or national history, and archival sources do not indicate other possible historical significance in the site. This site is therefore not believed to be eligible for nomination to the National Register of Historic Places and no further research is recommended.

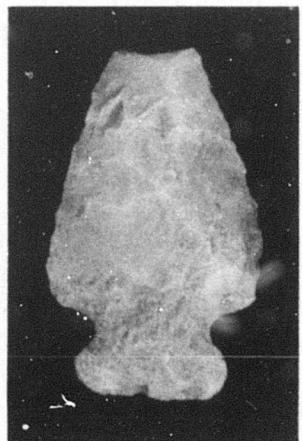
32EM112 (Prehistoric component)

The prehistoric component of site 32EM112 is located adjacent to and north of a small intermittent stream drainage which flows into the Missouri River (Lake Oahe). A building foundation (see Historic Component, above) has been built directly over the prehistoric materials and this too is eroding out of the cutbank. There is a fairly dense concentration of prehistoric cultural material on the eroded beach line and also exposed in the cutbank. Features exposed include two dark grayish-brown bands which are large and basin-shaped and which may be house floors. There are also two reddish-brown bands of oxidized earth which appear to be hearth remnants, one containing charcoal and one which is rock lined.

The site appears to be multicomponent. The ceramics are Plains Village but the two projectile points found (Figure 6.7a, b) appear to be Late Plains Archaic in age. These components may, however, be mixed. Historic material occurs in the first 30 centimeters of fill, with the prehistoric



a



b

Figure 6.7. Diagnostic artifacts from 32EM112.

material occurring 30 to 125 centimeters below the surface. Ceramics, a projectile point, lithic debitage, burned and unburned bone and shell fragments were all observed in the prehistoric levels.

Part of the site has been destroyed by erosion and historic activities, but undisturbed buried cultural material is still present at the site. The amount and variety of cultural material indicates that this site may be a significant prehistoric property which could contribute to the understanding of Middle Missouri prehistory. The site is therefore believed eligible for nomination to the National Register of Historic Places. Measures should be taken to mitigate the ongoing damage which is occurring at this site.

32EM113

Site 32EM113 is located just to the north of a small draw which leads into the Missouri River bottoms. It consists of a small cultural material scatter on an eroded beach area. No cultural material was observed on the stable ground in the site area. Material in the cutbank consists of one Knife River flint flake at 70 centimeters below the surface and one piece of bone at ten centimeters below the surface.

Cultural material observed on the beach includes lithic debitage of Knife River flint, gray Tongue River silicified sediment and fine-grained quartzite. Several bone fragments were also noted.

The site is believed to have poor physical integrity. There appears to be very little material left in the bank cut and what is visible is probably secondarily deposited. This site is not believed to be eligible for nomination to the National Register of Historic Places. The site has been mapped and photographed and it is believed that very little further information can be gathered at this location.

32EM114

This site is located on a raised area of the first terrace above the Missouri River. Most cultural materials found at this site are on the flat of the terrace, on the edge of, or just back from, the cutbank. No material was observed in the cutbank or on the beach.

Cultural material includes one Knife River flint biface, a Knife River flint utilized flake, and flakes of Knife River flint, Tongue River silicified sediment and fine-grained quartzite.

The integrity of this site is presently unknown. There is a possibility of buried cultural materials but the surface materials indicate that they are probably quite dispersed. If the site is entirely a surface manifestation, it is believed that significant information content above what has already been collected will be minimal. On the other hand, if buried cultural deposits do exist at the site, it may prove to be a significant property.

Testing is recommended in order to determine the site's significance. This could probably best be accomplished through the use of a number of shallow, but rather large, test units.

32EM115

Site 32EM115 consists of a very light scatter of cultural material at the confluence of a small draw with Lake Oahe. The material was found along the bank and on the beach for approximately 25 meters. One flake was found within the cutbank at 25 centimeters below the ground surface. Cultural material observed includes one large biface of Knife River flint, a flake of Knife River flint, another of Tongue River silicified sediment, and burned and unburned bone fragments.

It appears that very little remains of this site. The site is believed to be entirely a redeposited surface manifestation whose integrity is regarded as poor. This site is not believed to be eligible for nomination to the National Register of Historic ~~sites~~ due to its lack of physical integrity.

32EM116

A light scatter of bone fragments, burned bone, fire-cracked rock and three hearth features were recorded at this location. The material was observed from depths of five centimeters to two meters below the ground surface of the cutbank. There are also similar types of cultural material in the slump and over the beach area. The entire scatter of material is approximately 100 meters long. At least five potential cultural levels and/or paleosols are visible in the cutbank.

The site is rapidly eroding into Lake Oahe. Judging from the adjoining terrace next to the cutbank, most of the site has probably been destroyed. Intact features do, however, still remain at the site. Because of the heavy driftwood cover, it is unknown how much material is present on the beach. It is not possible to determine the significance of the site at this time. The hearth features do have a potential to yield important information and should be excavated as soon as possible. Beyond this, the significance of the site will be dependent on the extent, nature and integrity of buried cultural deposits.

32EM117

This site consists of a light density of burned and unburned bone fragments and one possible hearth eroding out of a loess cutbank. The material is from 25 to 140 centimeters below the ground surface. Three dark paleosols were visible in the cutbank. The locale appears to have been at the contact of the valley edge with the river bottoms.

The site is very rapidly eroding into Lake Oahe. Because of the amount of driftwood, it is difficult to ascertain how much cultural material has eroded out of the cutbank. It is believed, based on the surrounding steep topography, that most of the site is destroyed. The significance of this

site is unknown at this time. The site should be revisited during a period of low water and tested to determine its extent and degree of integrity. At least some in situ deposits are present but their significance cannot be determined without testing.

32EM118

Site 32EM118 appears to be an original homestead with both a log dwelling and two dugouts which were roofed with logs, poles and earth. Continued existence of such dugout roofs is very rare in the general region, but there is apparently little additional cultural information to be gained by further examination of the dugouts, both of which appear to have been animal shelters. This site apparently retains fair integrity, but a portion of the site apparently has been eroded into Lake Oahe. The standing structure is deteriorating quickly and is threatened by erosion into the lake.

Deed records for this site were not found in the files of the Emmons County Register of Deeds office in Linton, where several deed books are missing. Without the deed information the possible associations of the site with persons important in the history of the region or nation can not be assessed.

Because the site appears to have suffered from lake erosion and natural decay, it is unlikely that a defensible National Register nomination could be prepared for the site on the basis of existing information. However, local informants might be able to identify the former occupants of the site and determine how much of the site has been lost through erosion. The eligibility of this site should be considered unknown until a more intense effort has been made to identify the function, period of occupation, occupants, and other possible historical associations of the site.

IF LTA1383-506

This isolated find is a tertiary flake of gray Tongue River silicified sediment. The size of this artifact was not recorded.

IF LTA1383-509

This item is a tertiary flake of gray Tongue River silicified sediment, size grade 1 (i.e., less than one-quarter inch in size).

Township 134 North, Range 79 West

32EM7, the Badger Ferry site

Larson-Tibesar Associates did not relocate 32EM7 during the 1983 survey. The following description was compiled using site forms and a report provided by Virginia Gnabasik, archeologist, Riverdale Office, Corps of Engineers. The site form included in Volume III of this report was

also compiled by Virginia Gnabasik.

Will and Hecker (1944:77) describe the site as follows:

The Souverly or Badger Ferry Site (Archaic Mandan)....This site has never been under cultivation and from 8 to 10 inches of soil accumulation covers the original village surface. Two rows of definitely rectangular type lodge ruins show today. The area of the village was about 12 acres and apparently the occupation was short. Artifacts, broken bones, shell, potsherds, flint, and burnt stones show on the edge of the terrace. No evidence of a ditch or palisade show.

Continuation forms describing revisits to the Badger Ferry site have been completed by Farrell and Hoffman in 1952 (Jensen 1965), Carl Falk (University of Nebraska) in 1971, and Corps of Engineers archeologists (Larry Robson in 1979 and 1980, Virginia Gnabasik in 1984). Based on information from these forms and Gnabasik (1986:1-3) it would appear that the majority of the Badger Ferry site is on private land. An "eyeball survey" conducted by Robson in 1979 indicated that perhaps 5-7 earthlodge depressions are situated on land administered by the U.S. Corps of Engineers. The remainder of the site was described as situated on private land. Robson noted fragments of flint, shell and pottery in a jeep trail along the northwest corner of the site.

In 1980, Robson noted that the gravel pit had destroyed approximately 40 to 50% of the site area on private land and some damage to the site had taken place on Corps administered land. In 1984, Gnabasik reported that no gravel quarrying was taking place on Corps administered land and that the disturbed area on the northern edge of the site was still visible. Gnabasik also noted some lithics and bone in trail ruts on Corps administered land in the southern portions of the site. In 1986, the Corps of Engineers placed the site off-limits to gravel operations (Gnabasik 1986:1).

The updated North Dakota Cultural Resource Survey Site Form for Archaeological Sites completed by Gnabasik in 1986 (see Volume III of this report) states:

Lodge depressions are evident, but no fortification ditch. KRF flakes, shell fragments, sherds and bone fragments occur lightly scattered on the surface, but are mostly exposed in the cutbank and two-track trails in the area. No features are visible in the cutbank. Approximately one-third of the site has been destroyed by gravel pit operations on private land and also on Corps land along the shoreline. Shoreline erosion and gravel quarrying are not currently affecting the site....Approximately one-third to one-half of the site has been disturbed and/or destroyed by gravel pit operations mostly on private land, but also on Corps land along the shoreline. The site has never been cultivated....This site is one of the small number of earthlodge villages located on the east side of the Missouri River in North Dakota. Its rectangular lodge depressions and lack of a fortification ditch (see SIRBS site form) would place it in the Extended Middle Missouri Tradition at 1100-1550 A.D. (per Lehmer, 1971, Middle Missouri

Archeology).

Despite the amount of the Badger Ferry site destroyed by gravel operations, the site is believed to be eligible for nomination to the National Register of Historic Places because of its potential to contribute to our knowledge of the Extended Middle Missouri Tradition and more specifically, its settlement patterns. Larson-Tibesar Associates concurs with Gnabasik's recommendation (see Volume III of this report) that the site should be preserved and protected.

32EM19

In July of 1980, University of North Dakota (UND) survey crew members described the site as:

a small, low density of 10 chipped stone artifacts and one bone (probably Antilocapra americana). The site is on the edge of a high terrace above the Missouri River....Artifacts were recovered from the terrace edge and slopes. No subsurface deposit was determined to be present [SHSND site files].

The university crew collected nine flakes, one uniface, and one bone. Further descriptions are not given except for the bone (see above). The Larson-Tibesar crew collected an additional biface fragment of Knife River flint.

The site has been collected and it is not believed that any great amount of subsurface materials are present. The integrity of this site is therefore regarded as poor. The UND site form states that "the site is not considered eligible for nomination to the National Register of Historic Places" (SHSND site files). Larson-Tibesar Associates is in agreement with this recommendation. The site appears to presently lack good physical integrity and all significant information is believed to have been gathered.

32EM21

This site was discovered on July 24, 1980 by University of North Dakota (UND) Archeological Research personnel doing the inventory for the Northern Border Pipeline. The site was subsequently excavated but no report was available on that excavation at the time of the writing of this site report form. The UND site form initially described the site as an "occupation of the Missouri River bluffs by an unknown prehistoric group" (SHSND site files). Dr. Mike Gregg, Department of Anthropology and Archaeology, University of North Dakota, was contacted by phone and indicated that both Plains Woodland and Late Plains Archaic materials were found on the surface. Excavations in the area of pipeline construction revealed a Besant/Sonata level which was radiocarbon dated at AD 20 ± 100 years.

Gregg reported that he observed burned rock in the cutbank at the site area in August of 1983. At the time of the Larson-Tibesar inventory, no cultural material was observed in the site area.

Portions of the site area have been destroyed by the pipeline, others are in plowed field, and still others are underneath a covering of sod. Mike Gregg indicated that no buried cultural materials were found beneath the plow zone in the cultivated area of the site. Intact materials which may be left at the site would be at the south end of the site, south of the pipeline right-of-way.

If it can be demonstrated that intact cultural materials remain at the site, then it is believed that 32EM21 is eligible for nomination for the National Register of Historic Places. During the Northern Border inventory project, all cultural materials which would be impacted by the pipeline were automatically considered eligible for nomination to the National Register. It is assumed that this determination is still in effect.

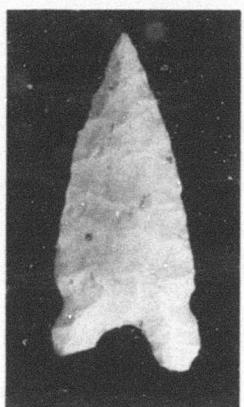
32EM30

Site 32EM30 consists of at least two cultural levels in the cutbank of Lake Oahe and an extensive scatter of material on the beach. The site is on the north side of an inlet formed by an unnamed tributary. The original site form for this locality was filled out by Ralph Thompson on November 30, 1980 (SHSND site files). Mr. Thompson reports having collected over 22 projectile points from the site location as well as numerous other chipped, ground stone and shell artifacts. Since these collections were made at a time of low water, it is very likely that some of the cultural materials are from the area designated in this report as 32EM99 (see below), on the south side of the inlet.

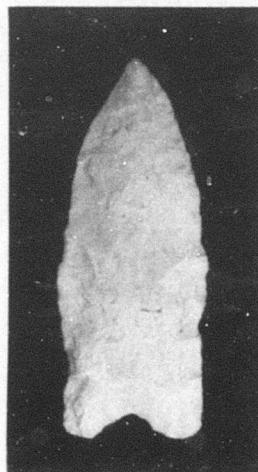
Projectile points within the Thompson collections indicate the presence of the Middle Plains Archaic McKean complex (Figure 6.8a, b) Late Plains Archaic (Figure 6.8d), Late Plains Archaic or Middle Woodland Besant (Figure 6.8e-g) and at least one Late Prehistoric period component within the assemblage (Figure 6.8h). The Larson-Tibesar crew also noted several McKean complex projectile points, one of which appears to be of the Mallory side notched variety (Figure 6.8c). Several ceramic sherds were also present at the site and appear to be from the Plains Village tradition.

Which, if any, of these cultural materials are related to the in situ levels observed is unknown at the present time. The upper level observed is in the cutbank approximately one meter below the present ground surface. The lower level is exposed at the level of the present beach, approximately two meters below the top of the cutbank. As already stated, there is a very heavy concentration of cultural material on this beach. At several places on the beach, the oxidized rings from hearth features are still visible. Most of the bones present are bison long bones, but beaver and deer or antelope elements are also present.

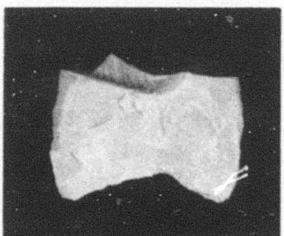
It is very likely that much of this site remains intact and that it is quite large in size. It is, however, being subjected to heavy erosion due to the reservoir. Because this appears to be a stratified site with good physical integrity, it has the ability to contribute to the understanding Middle Missouri prehistory. The site is therefore believed eligible for nomination to the National Register of Historic Places.



a



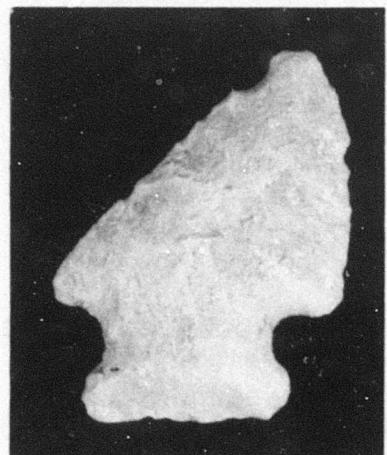
b



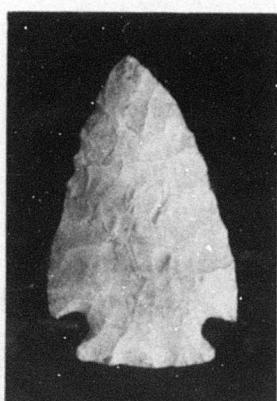
c



d



e



f



g



h

Figure 6.8. Diagnostic artifacts from 32EM30.

Measures should be taken to mitigate the damage occurring at this site. These should include a controlled surface collection of the beach materials, excavation of areas which will soon slump into the reservoir, and stabilization, if possible, of the rest of the site area.

32EM93

An abandoned farmstead was found at this location. The site presently contains five poured concrete foundations, two wells, two cisterns, an apparent outhouse depression, and a refuse deposit. This site is the remains of a post-1916 farmstead, which exhibits no likelihood of yielding important cultural information. Although the site may have originated as the domicile of the homesteader John A. Suverly, who filed for patent in 1891, the quality of concrete in the foundations indicates a later origin for most of the site. This site may be the precursor of an active farmstead to the southeast.

This site retains fair integrity. Although all buildings have been removed, the site apparently has not been otherwise disturbed. None of the persons associated with the title history of the property appears to have been particularly important in local, state or national history, and archival sources do not indicate other historical significance for the site. This site is therefore not believed to be eligible for nomination to the National Register of Historic Places and no further research is recommended.

32EM94

This site is located on a periodically inundated mud flat at the edge of Lake Oahe. A small amount of cutbank is exposed at the site area, generally a meter or less in height. Artifacts were observed only on the mud flat, not in the cutbank. Artifacts and fire-cracked rock appear to be actively eroding out of the mud. This mud is very clayey. It is approximately 25 centimeters thick and there appears to be a gravel bar beneath it.

Cultural material is uniformly distributed over the site area and consists of fire-cracked rock, 31 flakes of Knife River flint, two side scrapers, one biface fragment and a sparse amount of bone fragments. No features were observed.

While there appears to be no cultural material in the uplands surrounding the site, the mud flats may contain in situ cultural material of good integrity. Cultural material seems to be actively eroding out of this mud. The age of these deposits could not be determined on the basis of the cultural material observed on the surface. The significance of this site cannot be determined without testing. Measures should be taken to test the site as soon as possible since it appears to be eroding away quite quickly.

32EM95

This site is composed of two areas (A & B). Area A is on a slightly rolling terrace along the north side of a small bay. Debitage and bone is exposed in the cutbank approximately two meters below the surface. On top of the terrace there is a possible mound which is approximately 25 centimeters high and 13 meters in diameter. Area B extends along the reservoir beach west of Area A. It extends from the bay north approximately 200 meters to the vicinity of a small notch in the cutbank.

Cultural material in Area A includes bone fragments and debitage of Knife River flint and Tongue River silicified sediment. Area B contains similar materials as well as two biface fragments and one projectile point midsection, all of Knife River flint.

While Area B seems to be in poor condition, the terrace in Area A seems to have a good potential for in situ deposits. The significance of this site is unknown. Testing of the mound and surrounding terrace area is necessary to determine the nature and extent of the deposits. Area B is not considered significant.

32EM96

This site consists of a possible abandoned farmstead containing three fieldstone foundations, four depressions, and domestic artifacts including bottle glass, canning jar lids, shoe leather, crockery, and a Prince Albert tobacco can. The existence of a homestead site at this location is not indicated on General Land Office plats or on the 1916 Emmons County atlas, but both those sources commonly did not include all farmsteads or other settlements. This site appears to be a particularly well preserved homestead site. It is in a remote location and is not in immediate danger of erosion from Lake Oahe.

The eligibility of this site for nomination to the National Register of Historic Places is unknown at this time. None of the persons associated with the title history of the property appears to have been particularly important in local, state or national history, and archival sources do not indicate other historical significance for the site. However, the site could be of particular value for archeological investigation of the settlement process because of the apparent good integrity of the site. The site should be passively managed through avoidance of impacts until a later date, when archeological and other research about settlement sites will have indicated the nature and extent of information extractable from this site.

32EM97

Site 32EM97 consists of a buried cultural level and beach scatter of chipped stone tools, debitage, and bison bone on the south side of a small tributary to the Missouri River. This site may be part of the area originally described as 32EM30 (see above), but it has been recorded as a separate site because of the wide spatial separation of cultural materials noted during the 1983 inventory. This separation was due to high water

levels and the cultural materials discussed under the two site number designations may, in fact, not be separable at times of low water.

A cultural level containing bone and a fire hearth extends for approximately 15 meters along the bank at a depth of one meter below the surface. At the time of inventory, the beach was approximately ten meters wide. Cultural materials cover an area approximately 30 meters long.

Two projectile points were collected at the site. One appears to be a Late Prehistoric period unnotched variety and the other is an Archaic side notched point. Flakes found on the beach are of Knife River flint and Tongue River silicified sediment. One piece of quartz crystal was also observed. The fire hearth in the bank is approximately 30 centimeters wide and 15 centimeters deep.

The integrity of this site is unknown. There are in situ deposits in the cutbank, but their east to west extent is unknown. This site appears to contain one and possibly two levels consisting of small, limited activity camp areas. As such, most of the site may have already been destroyed. On the other hand, there is a fairly large flat area behind the cutbank which may contain more of the site. The significance of this site cannot be determined without test excavations. It is unknown which, if either, of the projectile points found on the beach relate to the cultural levels. Testing should be done to determine the number of cultural levels present, their age, and their extent.

32EM98

This site consists of an exposure of at least four bison skulls in an arroyo cut. No artifactual material was observed, but such a concentration of skulls in a small area indicates that they are probably related to cultural activity.

The integrity of this site is undetermined at this time. Three of the four skulls are deeply buried in one to two meters of deposits, while the fourth was found just back from the knick point of the the arroyo very near the surface. It seems likely that the skulls observed are the lag deposits from the erosion of a more diversified assemblage within a kill location or processing area. If intact cultural levels are still present in the site area, they could be east, north or south of the present arroyo cut and are probably deeply buried.

The significance of this site cannot be determined until more is known about its integrity. Testing is recommended in order to remove the exposed skulls, look for an intact cultural level, and date the deposits. The area is inaccessible by heavy machinery such as a backhoe. A combination of augering and hand excavation would probably be the best testing techniques. The site is presently not endangered by the reservoir and pot hunting seems unlikely.

32EM99

This site consists of at least three and possibly four cultural levels exposed in an approximately five meter deep cutbank on the north side of an unnamed tributary of the Missouri River. All exposed cultural levels contain bison bone and fire-cracked rock. One of the lower levels contains a definite rock-filled, basin-shaped fire hearth with enough charcoal for dating and wood speciation. No lithics or ceramics were observed at the site. Most bone appears to be bison.

A full assessment of integrity for this site is not possible based on the survey information. The intact hearth does seem to indicate that some in situ cultural deposits are present. The significance of this site is unknown at present. It is recommended that the hearth be excavated and additional testing be done to determine the site's eligibility for nomination to the National Register of Historic Places.

32EM100

This site occurs on a gravel terrace being eroded by wave action. Cultural materials are exposed in the cutbank for approximately 100 meters south of a water pipe leading out of the water. There is also an isolated hearth in the bank approximately 100 meters north of this pipe. This site may be related in some way to the previously recorded Badger Ferry site (Will and Hecker 1944:77).

Most of the cultural material observed is still within the bank with very little on the beach area. A five meter long area of the bank was randomly chosen and the material (all within one level) counted. This yielded the following:

- 26 small pieces of bone
- 4 gray Tongue River silicified sediment flakes
- 3 Knife River flint flakes
- 5 small pieces of fire-cracked rock

Most of the identifiable bone appears to be bison but two foot elements appear to be antelope. At other places in the bank exposure, one simple-stamped body sherd and a large curved unifacial tool of Tongue River silicified sediment were observed. The cultural level is from 75 centimeters to one meter below the ground surface. The hearth contains small amounts of fire-cracked rock. It is approximately 30 centimeters in diameter and 30 centimeters deep.

The integrity of this site cannot be assessed without testing. It does appear to be an intact cultural level, but its east to west extent and its condition cannot be determined at this time. The site should be tested to determine its eligibility for nomination to the National Register of Historic Places. Until such testing can be undertaken, the site should be regarded as potentially significant and measures should be taken to limit future impact, especially from activities associated with the water pipeline and a nearby gravel quarry.

IF LTA1383-603

This isolated find is a tertiary flake of gray Tongue River silicified sediment, size grade 3 (i.e., greater than or equal to one-half inch but less than one inch in size).

IF LTA1383-604

A tertiary flake of gray Tongue River silicified sediment, size grade 2 (i.e., greater than or equal to one-quarter inch but less than one-half inch in size) was found at this location.

IF LTA1383-605

This isolated find is a secondary flake of Knife River flint, size grade 4 (i.e., greater than or equal to one inch but less than two inches in size).

IF LTA1383-607

LTA1383-607 is a projectile point tip manufactured of Knife River flint. The age of the artifact is unknown.

IF LTA1383-608

Artifact LTA1383-608 is a secondary flake of gray Tongue River silicified sediment, size grade 3 (i.e., greater than or equal to one-half inch but less than one inch in size).

IF LTA1383-609

This item is a secondary flake of Knife River flint, size grade 3 (i.e., greater than or equal to one-half inch but less than one inch in size).

IF LTA1383-610

LTA1383-610 is a tertiary flake of Knife River flint, size grade 3 (i.e., greater than or equal to one-half inch but less than one inch in size).

Township 135 North, Range 78 West

32EM88

This site is located at the edge of an eroding terrace with Lake Oahe to the west and Devil's Gulch to the south. Cultural material was found in

the cutbank from depths of one to 2.5 meters below the ground surface as well as in slumppage of varying depth. There appears to be at least two concentrations of material which may be actual cultural levels.

Most of the materials observed are concentrations of broken bison bone. One concentration of shell and a single Knife River flint flake were also observed.

The site appears to have suffered moderate to extensive impact from erosion. The physical integrity is therefore unknown at this time. The significance of this site cannot be evaluated until its degree of integrity has been established. Mechanical testing of the site area is recommended to determine if there are intact cultural levels present and, if so, to determine their age and extent.

32EM202

The original River Basin Survey form for this site was completed by R.C. Farrell and J.J. Hoffman on September 6, 1952. They described the site as "scattered camp material...on north side of gulch" (SHSND site files). The site area was apparently in cultivation in 1952.

The site is located on a high terrace with Lake Oahe to the west and a deep drainage cut to the south. Cutbank erosion of Lake Oahe has produced a cliff edge on the west side of the site which is approximately 20 meters in height.

The 1983 inspection of the site revealed mostly undiagnostic bone fragments exposed in the trail. Knife River flint flakes are also present in the trail and along the edge of the cutbank. No materials were visible in place within the cutbank but it was not possible to get a good view of that exposure.

Because of a pile of flakes found in the trail, it appear that 32EM202 has been visited by amateur collectors. It also appears to have been severely damaged by bank erosion and past cultivation. This site is not believed eligible for nomination to the National Register of Historic Places due the apparent lack of good physical integrity. It is believed that little information could be gained from further work at 32EM202.

32EM203

The original site form for this site was filled out by R.C. Farrell and J.J. Hoffman on September 6, 1952. They described the site as "scattered and thin camp (?) refuse...on high bluff above river" (SHSND site files). In July 16, 1980, Virginia Harris, with the Corps of Engineers, visited the general vicinity of the site and found five bone fragments in the bank: "The skeletal material is situated approximately 1 meter beneath the surface of the bank and is concentrated within an area about 3 meters in length. Two holes, approximately .5 meter in diameter, were observed near the skeletal material & bone fragments were observed in the backfill piles..."(SHSND site files). This material was not observed either in 1983 or in the earlier 1982 Larson-Tibesar inventory of the same general

vicinity (Larson et al. 1983).

A moderate scatter of cultural material was found on the south facing hill slope and in an adjacent shelter belt. There is no evidence of materials in the cutbank. No ceramics were observed in 1983. A biface tip and one piece of quartz crystal were mapped. The rest of the materials observed are unmodified Knife River flint flakes.

The integrity of this site appears to be poor. All material observed appears to have been moved down slope by natural erosion. The portion of the site described by Farrell and Hoffman has probably eroded into the reservoir. This site is not believed to be eligible for nomination to the National Register of Historic Places due to its lack of physical integrity.

Township 135 North, Range 79 West

32EM89

This site is a single circular depression with no visible artifacts or associated construction materials. The origin and function of this site are unknown, and heavy ground cover may have precluded observation of diagnostic artifacts. Although this depression is generally similar to many historic homestead cellar depressions, no archival or physical evidence has been found to indicate such a function and association.

Limited testing should be conducted to determine the origin and function of the site. None of the persons associated with the title history of the site appears to have been particularly important in local, state or national history, and archival sources do not indicate other historical significance for the site. If the site is the remains of a homestead or later farmstead, it would not be considered to be eligible for nomination to the National Register. Without testing, however, the function and the eligibility of the site cannot be determined.

32EM90

This site is part of a farmstead containing a number of standing log and frame buildings (Figure 6.9). The present site designation includes a standing log and frame barn, the ruins of a second log building, and a refuse deposit. Much of the site is, however, on private land and was therefore not fully documented.

According to a 1899 General Land Office plat, this site is the Charles Gilman homestead and it appears to retain several original or early buildings from that homesteading era. While the barn and other log building recorded under the present site designation are not outstanding or unique architecturally, they do retain surprisingly good integrity. This site is one of a very few original homestead sites to remain in apparent intact condition in the area.

Because the barn and the dump appear to have been integral parts of the total farmstead, the portion of this farmstead which has been recorded



Figure 6.9. Barn at 32EM90.

(i.e., the portion on federal land) cannot be evaluated without reference to the remainder of the site. The significance of this site is therefore unknown.

32EM92

An extensive deposit of auto parts and some common domestic items was recorded at 32EM92. The items in this dump appear to date from the 1930's to the 1950's. The large number of automobile parts indicates the site may have been used as a junkyard or auto repair area. This site is a dump related to a larger farmstead of good physical integrity. The artifacts on this site do not appear to contain important cultural information, and the farmstead site, of which the dump is a part, probably dates from after 1916. None of the persons associated with the title history of the property appears to have been particularly important in local, state or national history, and archival sources indicate no other historical significance for the site. This site is therefore not believed to be eligible for listing in the National Register of Historic Places and no further research is recommended.

IF LTA1383-611

This isolated find is a tertiary flake of Knife River flint, size grade 2 (i.e., greater than or equal to one-quarter inch but less than one-half inch in size).

IF LTA1383-612

This isolated find is a plain ceramic body sherd, size grade 3 (i.e., greater than or equal to one-half inch but less than one inch in size).

Township 136 North, Range 78 West

32EM10, the Shermer site

The quotes from Sperry (1968) given below serve to describe the Shermer site. The site is virtually unchanged from this description:

The village is bordered on the west by the edge of the second terrace of the Missouri River and on the north by the terrace of Alkali Creek. A broad flat alluvial valley floor reaches from the base of the terrace below the site to the present channel of the Missouri River, approximately two miles to the west...

The east and south boundaries of the site are marked by a fortification ditch backed by a palisade wall. The ditch is approximately 1,545 feet long. The site covers an area of about 10.5 acres. The entire site except for a small portion in the northwest corner, once occupied by farm buildings, is under cultivation. Five house depressions were present in this area. Two were

partially cut by a road which is located along the west edge of the site....Four bastions were visible on the uphill or north-eastern trending portion of the ditch to the south and one was visible in the southeast corner just before the ditch enters the natural erosional channel of the gully.

It is presently impossible to make a complete count of the number of houses due to years of cultivation of the site. Fortunately, several descriptions and maps of the site made during the early part of the century are available [p. 2].

During the 1965 field season, excavations were conducted in the northeast corner of the site....The excavations were oriented toward gathering information on the structures in this area, obtaining an artifact sample from middens, and exploring the terrace edge for traces of fortification....Excavation was undertaken in the northeast corner of the site during the 1966 field season.

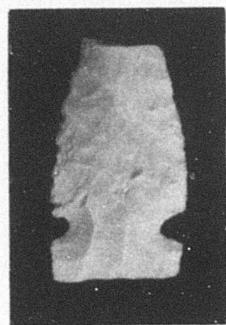
Houses 1, 4, and 6 were excavated during the 1965 field season and House 7 was excavated in 1966 [p. 8].

From the information available, it appears that both Huff and Shermer can be assigned to the same phase. While basic similarities exist, Shermer differs significantly enough that a taxonomic distinction should be drawn at least at the level of subphase. It seems advisable at the present time to refrain from drawing a rigid taxonomic framework for the two sites. Information is still needed from additional Terminal Middle Missouri sites in the area, firmer dates need to be established, and relationships need to be examined with fortified sites located to the south which are presently assigned to the Thomas Riggs focus [p. 84].

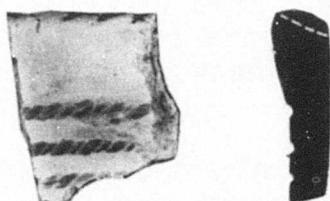
The federal portion of the Shermer site has been taken out of cultivation and is stabilized except for the two-track trail leading through the western edge of the site. This trail is continually eroding out a great deal of cultural material. It is uncertain how much damage is occurring due to cultivation of the private portions of the site. The Shermer site is believed to be eligible for nomination to the National Register of Historic Places due to its demonstrated integrity and its ability to yield further significant data concerning Middle Missouri prehistory.

32EM80

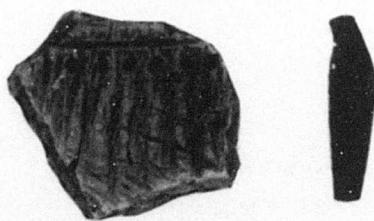
The site is located on a high terrace which overlooks an oxbow lake to the west and a deep draw to the south. The edge of the terrace has slumped dramatically to the west. The majority of cultural materials are located in the cutbank of this slump. Approximately 75 flakes, most of Knife River flint, were observed in the the cutbank and trail. Bone, a Late Prehistoric period projectile point (Figure 6.10a) and two body sherds, one smooth, one cord-roughened, were also observed.



a



b



c

Figure 6.10. Diagnostic artifacts from 32EM80 (a) and 32EM79 (b,c).

The site appears to have suffered moderate to extensive impact from erosion and bank slumping and some light impact from vehicle traffic. Some of the cultural deposits are deep, however, and may not have been affected by these impacts. The significance of this site cannot be determined without further investigations to assess its integrity. The site may extend east into private land, but this could not be determined on the basis of surface evidence. The site should be tested to in order to determine its integrity and extent.

32EM81

The site consists of a large amount of bison bone exposed in several strata from one to four meters below the stable ground surface and also visible down in the cracks of the slump block. The thickest level of bone is approximately 2.5 meters below the ground surface. The exposure is approximately 100 meters long (north to south).

One piece of gray Tongue River silicified sediment was observed on the northern edge of the site. This piece is of poor quality and may be natural. Several pieces of fire-cracked granite were seen within the cracks of the slump block. There is no evidence of modification on the bone.

The integrity and overall extent of the site are unknown at this time. Because of the extensive laminated sand and gravel lenses above and below the site, 32EM81 appears to be reworked and redeposited materials, but testing will be necessary to substantiate this. The significance of the site is unknown. If intact materials can be found within the exposed strata, they could have great antiquity.

The site should be mechanically tested and several radiocarbon samples should be analyzed on the bone from the lower levels. Individual bones, and not articulated units, make up the faunal assemblage as it is exposed in the slump.

32EM82

Site 32EM82 consists of two refuse deposits located in two gullies at the edge of the Missouri River escarpment. Most of the cultural items within the deposits appear to have been deposited within the last 20 years.

This site does not appear to contain important cultural information and archival sources do not indicate other historical significance for the location. This site is therefore not believed to be eligible for nomination to the National Register and no further research is recommended.

32EM83

This site appears to be a large farmstead dating from after 1920, although the remains of an apparent log dwelling and old cellar excavations may indicate an earlier occupation. The site includes various farm and domestic artifacts, two wells, several concrete foundations, a collapsed

root cellar, a ruin of a log structure, and three apparent cellar depressions. This site retains fair integrity. Although all structures have been removed from the site, the ground surface has apparently not been disturbed since the site was abandoned, which was probably in the mid-1950's or later. No farmstead is indicated on this site in General Land Office plats of the 1880's or on the 1916 Ogle Atlas of Emmons County. None of the persons associated with the title history of this site appears to have been particularly important in local, state or national history, and archival sources do not indicate other historical significance for the site. This site is therefore not believed to be eligible for nomination to the National Register of Historic Places and no further research is recommended.

32EM85

This site is an abandoned farmstead containing four distinct cellar depressions, scattered bed framing, and a sparse scatter of metal and milled lumber. This site is likely the remains of the Charles E. Coover homestead, which was patented to Coover on December 12, 1907. A 1916 atlas indicates a farmstead very near this site as the Martha M. Coover farmstead (Martha M. was apparently wife of Charles E. Coover). None of the persons associated with the title history of the site appears to have been particularly important in local, state or national history, and archival sources indicate no other historical significance for the site.

The eligibility of this site for nomination to the National Register of Historic Places is unknown. The site does not appear to have been disturbed, and it may be a good representative of an area homestead for archeological investigation. There are no archival or site-physical indications that the site is outstanding in any other way. The site is in no apparent danger at this time and it is in a relatively remote location. The site may be managed by avoidance until a later date when sufficient archeological and other investigation has been conducted of homestead sites to indicate the direction and/or need for additional investigations at this site.

32EM86

This site consists of a pile of hewn and unshewn logs, some of which have dovetail and square-notched ends. The logs contain both square cut and round wire nails. The origin and function of this site are unknown, but the logs on the site appear to have been salvaged from another building or buildings. The building is in pieces. No artifacts were observed on the site other than the nails in the logs and one piece of sheet metal.

The site does not appear to contain extensive cultural information or remains, and does not appear to have been a domicile or major activity area. None of the persons associated with the title history appears to have been important in local, state or national history, and archival sources indicate no other historical significance in the site. This site is therefore not believed to be eligible for nomination to the National Register of Historic Places and no further research is recommended.

32EM87

This site consists of three concentrations of modern refuse in three gullies leading to the river bottoms. Refuse includes modern cans and bottles, parts of a Pyrex mixing bowl, a sardine can, and pieces of a Monarch wood-burning range.

This site is apparently a dump site which may date from as early as 1930, but more likely from the early 1950's. The trash has not been disturbed. The contents of the dump are common domestic and farm items and the dumps exhibit no special likelihood to yield important cultural information. The dump may have been associated with the John Shermer (Schermer) farmstead which, according to a 1888 General Land Office plat, was located nearby.

None of the persons associated with the land title of the property appears to have been particularly important in state, area or national history, and archival sources do not indicate other historical significance for the site. This site is therefore not believed to be eligible for nomination to the National Register of Historic Places and no further research is recommended.

32EM91

Site 32EM91 consists of an apparent abandoned farmstead now including a rectangular depression, an auto body and refuse dump, a foundation and other remains of a wood frame dwelling, a well, a large poured concrete foundation, and the pad outline of another large building. This site appears to have been abandoned within the past five years, possibly because the dwelling burned. All buildings have been removed but the site surface has apparently not been disturbed.

The site exhibits no particular likelihood of yielding important cultural information. It is unknown if this site is the original domicile of homesteader John Wilde; atlases and General Land Office plats do not indicate a farmstead on this site before 1916. Wilde came to Bismarck from Michigan in 1877. He worked as a foreman on the Northern Pacific Railroad and in 1885 homesteaded in Emmons County. "He built an unusual home, with logs in an upright position. It was a two-story house with checkerboard roof -- the shingles two different colors" (Woods and Wenzel 1976:161).

None of the persons associated with the title history of the property appears to have been particularly prominent in local, state or national history, and archival sources indicate no other historical significance for this site. This site is therefore not believed to be eligible for nomination to the National Register of Historic Places and no further research is recommended.

Township 136 North, Range 79 West

32EM11, the Glencoe site

The original River Basin Survey form for this site was completed by George Metcalf on December 14, 1950. R.C. Farrell and J.J. Hoffman added additional information on the site on September 5, 1952. Will and Hecker (1944:78) describe the site as follows:

The Glencoe Site (Middle Mandan)...The surface of this site has been obliterated by cultivation. Potsherds, flint spalls and artifacts, bones, burnt stones, etc. show scattered thinly over about 12 acres. Cache pits show in eroded terrace. Occupation was short here, or there were only a few inhabitants. The pottery is Middle Mandan type.

The site is on a high terrace above the Missouri River bottoms. The surface is gently rolling and generally slopes toward the southeast. Most of the site is covered by weedy grasses, but cultural material is visible in the two-track which passes through the site. Cultural material is also exposed in profile in several deep borrow pits on the south side of the site. Material in the cuts appears to be from 20 to 50 centimeters below the surface. These cuts are probably related to dam construction and may be the disturbance described by Farrell and Hoffman in 1952. No lodge depressions are visible.

As stated by Farrell and Hoffman, some of the site has been destroyed by blading and cultural materials have been incorporated into the dam fill. Much cultural material still appears to remain in place, however, and the site has not been "totally destroyed" as was earlier believed. The significance of this site is presently unknown. The 1983 visit to the site indicates that the occupation may have been longer than believed by Will and Hecker (see above) and the integrity is much better than believed by Farrell and Hoffman. Although the site is believed to be an Extended Middle Missouri village, testing will be necessary to conclusively demonstrate this.

32EM77

This site is located at the edge of the first terrace above the Missouri River and on the south side of a small coulee. Most of the cultural material was found in the eroded bank edge of the terrace. Old trails come out of the valley bottom and cross the terrace. Some cultural material was observed in these. Cultural materials consist of small, unidentifiable bone fragments, flakes of Knife River flint, gray Tongue River silicified sediment shatter, a small amount of fire-cracked rock and several utilized flakes.

The site appears to be only slightly disturbed by natural erosion in the area of the cutbank. The condition and nature of the buried deposits, however, can only be determined through testing. This site may contain significant information content but the scarcity of materials on the surface makes assessment of significance difficult. National Register eligibility cannot be determined without subsurface testing.

32EM78

Site 32EM78 consists of a very large mound (Figure 6.11) and a thin exposure of cultural material, all to the south of an intermittent drainage and east of the edge of Lake Oahe. Knife River flint flakes, a plain body sherd, one piece of fire-cracked rock, and several small bone fragments were found on the surface of the site.

The physical integrity of the mound is excellent with no pot holes or rodent burrows. For this reason, the actual nature of the mound is difficult to determine. The surrounding cultural material appears in a two track trail and in the cutbank of the reservoir. Bank erosion is occurring, but at a fairly slow rate. Overall integrity of the site appears good.

This site should be considered potentially eligible for nomination to the National Register of Historic Places, but this is contingent upon establishing the antiquity of the mound and/or the integrity of the surrounding cultural materials. The mound does appear to be artificial, but it is not in a typical setting for a Woodland burial mound and it is possible that it is a natural glacial or postglacial feature. This can only be determined through testing. If the mound is a prehistoric cultural feature, it is probably one of the largest mounds in the lower Knife-Heart region. It is believed to be cultural primarily because of its extremely symmetrical dimensions and its association with cultural materials. The mound should be tested, probably first by augering and then followed up with a hand excavation unit. The region near the cut bank should also be tested. The one piece of pottery observed does not appear to be Woodland, but it is very small and fragmentary.

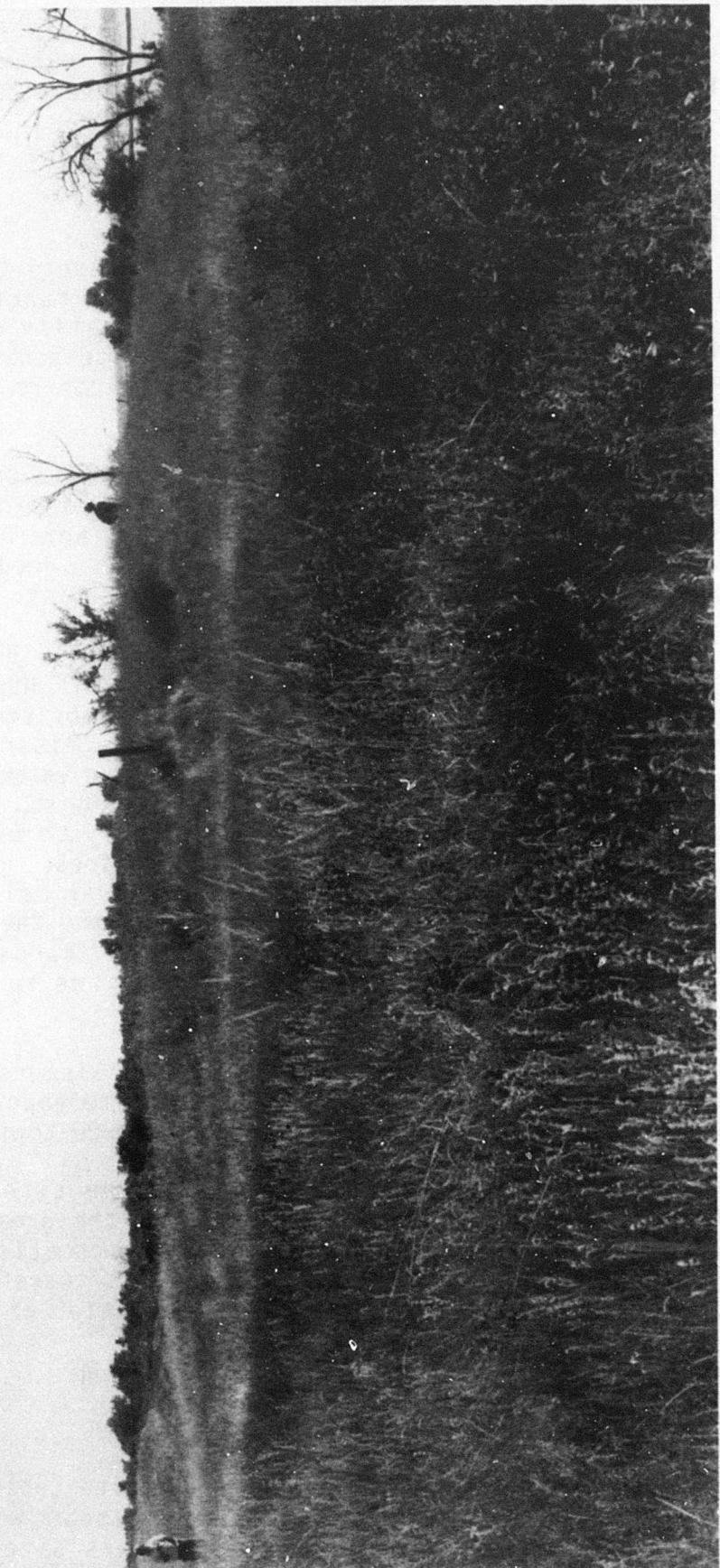
32EM79

The site consists of a cultural material scatter occupying a terrace with the Missouri River (Lake Oahe) to the west and an intermittent drainage to the north. This drainage separates the site from 32EM11. Artifacts are visible in the trail and on the surface of a previously cultivated area of the site. There is a concentration of materials in a blowout near the north edge of the terrace. No evidence of structures or features was observed, but this may be due to past cultivation. The site is in a good setting for an occupation site.

Lithics on the site are predominantly Knife River flint and gray Tongue River silicified sediment. Eight sherds, only one of which is a rim sherd, were observed. The ceramics seem to indicate two cultural components at the site. The rim sherd (Figure 6.10b), while quite fragmentary, has cord-impressed decoration on the rim and lip resembling Middle Missouri tradition Fort Yates ware. Many of the body sherds, on the other hand, are cord-roughened with small, tool impressed decorations on the exterior surface (Figure 6.10c). These are believed to be related to the Late Woodland variant.

Portions of the site appear to have been impacted by erosion, dam construction, vehicle traffic, and past cultivation. However there is a

Figure 6.11. Mound feature at 32EM78.



good possibility that intact cultural materials exist below the old plow zone (circa 20 to 30 centimeters). The site has the potential for being a Plains Village settlement of considerable size. Present investigations were unable to determine the exact age or nature of the site. It is believed that features could be found and investigated through the use of hand excavation.

32EM84

This site consists of a single poured concrete foundation and the floor remains of a wood frame structure of unknown function. The site is near the former townsite of Glencoe, but the quality of the poured concrete indicates a post 1920 construction. This site retains poor integrity as a farmstead, but the surface and subsurface deposits appear to be undisturbed.

The property was patented to Charles Corbin on May 22, 1899. Subsequent owners were Ellen F. Corbin, Benjamin Corbin, George Corbin, Flora Thayer, Warren E. Thayer, Frank Fox, Millie Fox, Daniel Williams, Gus O. Kratt, Hilda A. Kratt, and Robert H. Woodland. Woods and Wenzel (1976:119) relate the following information about the Corbins:

Benjamin Corbin and his wife, known as Uncle Ben and Aunt Becky, were well known pioneers. He was a wolf hunter, real estate agent, lecturer, and fisherman. They established a country store and Corbin Hotel on the east bank of the Missouri River, a mile south of the Glencoe Church. It was known as the gathering place for the community up until the early 1900's....Their dinner bell served a dual purpose: to call the family to meals and also as a signal when there were fish on the fishlines. Uncle Ben had about an inch sisal rope attached to the dinner bell. This rope was laid down the slight slope to the river, and the fish line tied to the rope. When the dinner bell rang, all hands knew there was a large fish on the line. Someone took time to take the fish off the hook and picket it in the river.

According to informant Ralph Thompson of Bismarck, the Corbin Hotel was located near this location. The present site appears to be too recent to be the Corbin Hotel or a part of an 1880's-1900 townsite.

None of the persons associated with the site appears to have been particularly outstanding in the history of the area, state or nation, and there are no other physical or archival indications that this site has other historical significance. This site is therefore not believed to be eligible for nomination to the National Register of Historic Places and no further research is recommended.

32EM126

This site consists of a well, three poured concrete foundations, and a refuse scatter. It is an apparent farmstead without distinguishing physical features or characteristics. This site retains low physical integrity. None of the three persons associated with the title history

appears to have been important in local, state or national history, and archival sources indicate no other historical significance for the site. This site is therefore not believed to be eligible for nomination to the National Register and no further research is recommended.

Township 137 North, Range 79 West

32BL1

The original River Basin Survey form for this site was completed by George Metcalf on December 8, 1950. R.C. Farrell and J.J. Hoffman added further information to that form on September 5, 1952. Will and Hecker (1944:79) describe 32BL1:

An Unnamed Site (Archaic Mandan)...This site has never been under cultivation but the area being subject to heavy wind erosion, only a few lodge pits show on the surface. These pits are widely spaced over about 15 acres and appear to be rectangular type house ruins. Considerable refuse shows on the side of the bluff but 8 to 10 inches of soil accumulation covers the original village surface, concealing any evidence back from the edge. The pottery is of Archaic Mandan types. About 80 rods north of this site on the edge of the terrace three house pits show the floors plainly in the profile of the terrace cut-bank.

Although both Will and Hecker and later investigators indicate the presence of lodge features on the site, it seems likely that some of these are small pond depressions. Aerial photos of the region indicate that it is pockmarked with these features.

Cultural materials are exposed in rodent borrows, in the trail passing through the site and at places along the cutbank. There are at least two depressions in the site area which may be lodges. Cultural materials extend for an unknown distance on to private land to the east. Cultural materials observed include a thin scattering of Knife River flint flakes, plain and simple-stamped body sherds, bison bone and other bone fragments.

Early accounts indicate that the site has never been under cultivation. Neither the trail nor the reservoir have significantly harmed the site. Integrity is therefore believed to be quite good. This site is believed to be potentially eligible for nomination to the National Register of Historic Places. Testing should be undertaken to determine the nature and quantity of cultural material and to make an absolute eligibility determination.

32BL49

This site is a relatively recent deposit of trees, brush, miscellaneous sheet metal and a piece of farm machinery. This site does not appear to contain cultural information sufficient to be considered eligible for nomination to the National Register, and no further cultural research is recommended.

32BL52

This site is an abandoned occupation site, now evident as a shelter-belt, the rectangular pad area of a structure, scattered auto parts, and an improved spring. The site is apparently a farmstead, but may be a replacement location for the homestead headquarters.

This farmstead apparently retains fair integrity. All buildings have been removed, but the site area is apparently undisturbed.

The property was patented to Henry Gager in 1889, and a 1912 atlas shows the A.A. Stewart farmstead on this location. Improvements on this site apparently were very minimal, and it is possible that the main portion of the site is to the west, in an area often inundated and now overgrown with thick reeds. The shelterbelts on the site appear to be no more than 30 years old.

The site exhibits no indication of containing important cultural information. None of the persons associated with the title history appears to have been particularly important in local, state or national history, and archival sources do not indicate other historical significance for the site. This site is therefore not believed to be eligible for nomination to the National Register of Historic Places and no further research is recommended.

Township 137 North, Range 80 West

32BL5, the Holbrook site (Prehistoric component)

The original River Basin Survey form for this site was completed by George Metcalf on December 12, 1950. The site is an earthlodge village of unknown size. Much of the site appears to be on private land which is in cultivation. On the Corps property, there is very little material on the surface, but cache pits, lodges, fire hearths, and artifactual material are clearly evident in erosional features (Figure 6.12). No lodge depressions are visible on the surface. There is a small mound of unknown age or origin near the western edge of the site. A small trench has recently been dug through the site area and much cultural material is visible in its backfill dirt. Will and Hecker (1944:80-81) describe the Holbrook site:

The Holbrook Site (Middle Mandan)...Evidence of a village site shows on 10 to 13 acres of a cultivated field. This site has been under cultivation for 60 years. Potsherds, ashes, broken bones, flint spalls and artifacts, etc. show over the field with lodge pit ruins still faintly showing. House ruins are widely spaced and when Mr. Will first visited the site about 40 years ago a well defined ditch could be traced around the site. The type of lodges used cannot be determined from surface appearance today. A number of cache pits show in the bluff edge, where water erosion has cut down the bank. The pottery is of Middle Mandan period types. No contact material shows at this site.



Figure 6.12. Exposed cache pit at the Holbrook site, 32BL5.

Lehmer (1971:121) assigns the Holbrook site to the Terminal Middle Missouri variant. This assignment was apparently made solely on the basis of the above quoted statement in Will and Hecker that a fortification ditch was once visible at the site. If such a ditch is a feature of the site, then the two ends of it should be on Federal land, next to the cutbank of the river. Exploration for this feature should be one of the primary goals of any excavation at the site.

Cultural material observed includes large amounts of unidentifiable bone fragments, more than 50 sherds (mostly plain body sherds), and small amounts of debitage composed of Knife River flint, fine-grained quartzite and chert. Although large portions of the site have been disturbed and/or totally destroyed, a large number of features are still apparently intact. Bank and stream cut exposures indicate in situ deposits with good physical integrity. It is believed that enough of the Holbrook site remains intact to be able to yield significant information concerning Middle Missouri prehistory. The site is therefore believed to be eligible for nomination to the National Register of Historic Places.

32BL5 (Historic component)

Site 32BL5 also contains a very large historic excavation at the edge of an escarpment, which now contains recently deposited refuse. This historic component does not appear to be older than ten years and does not appear to be likely to yield important cultural information.

The property was patented to Thomas Gandy (Homestead Certificate 1807), but according to an 1892 General Land Office plat Gandy's domicile was not on this site. Subsequent owners were Arvilla Gandy, Amos Robidou, Germain Chabot, Jean Faix, Eugene Wachter, Emma Wachter, Paul Wachter, Christina Robidou, Josephine Faix, Ella E. Gordon, C.W. Gordon, Peter Heltenberg, A.P. Lenhart, LeRoy Lighthizer, Mary J. Lenhart, Oscar Hiram Lighthizer, Mary Jane Christensen, Robert P. Small, Roger M. Berg, Jerome Braxmeyer, Gloria Braxmeyer, Burton Riskedahl, Margo Riskedahl, and Dorothy Blick. This property apparently has been an investment football, and most of the owners have been Bismarck businessmen or wives and widows of businessmen. Amos Robidou homesteaded nearby but later lived in Bismarck, worked for hotel and sawmill owner Bly, and was a city alderman in 1890. Germain Chabot (Sabot) was a French Canadian immigrant who lived in Bismarck. The Wachters were and are prominent businessmen and developers in Bismarck. A.P. Lenhart was a drugstore owner, civic leader and Mayor of Bismarck from 1921 to 1937 (Bird and Taylor 1972:59, 87; Crawford 1931:191).

Although several of these persons were prominent in local history, their prominence did not arise directly in association with this site, and archival sources do not indicate other historical significance for the site. The historic component of 32BL5 is therefore not believed to be eligible for nomination to the National Register of Historic Places and no further research is recommended.

32BL46

Site 32BL46 is located approximately 300 meters east of the Missouri River. In the past, the river appears to have flowed just below the site. The bottoms are now covered with a fairly dense growth of trees and no cultural materials were observed there.

Although no lodge depressions were observed, the cultural material found appears to be Plains Village tradition and covers a fairly large area. The majority of cultural material observed is eroding out of blowouts and bank cuts along the south and east edges of the site.

Most of the cultural material consists of Knife River flint flakes and small body sherds. There are also small amounts of fire-cracked rock and bone fragments. Ceramics are very thin and appear to be sand tempered. Some are simple-stamped and one piece has parallel shallow, incised or brushed markings on it. Ceramics are buff colored on their exterior and black on the interior.

Examination of aerial photos as well as the hard pan encountered in shovel tests indicate that the site area has been under cultivation in the past. The amount of disturbance which was caused by this plowing is difficult to determine. The blowouts and cutbank profiles indicate that at least some of the site is still in place.

This site may yield information important to the understanding of the prehistory of the region. The ceramics observed are not typical Woodland or Extended Middle Missouri types. This site could be late (Coalescent?) or could be an intrusion from another region of the Plains. The site should be tested to recover a better ceramic sample, date the site, locate intact features and assess integrity prior to making a determination of eligibility for nomination to the National Register of Historic Places.

32BL47

This site is apparently the remains of a farmstead which now contains three distinct depressions and a slight scatter of domestic artifacts in the adjacent cultivated field. This site retains low integrity. No structures remain on the site, and the site is apparently undisturbed.

General Land Office plat of 1886 and the 1912 Ogle Atlas of Burleigh County do not indicate a farmstead at this site. The property was patented to Patrick Small in 1891. Small was an immigrant from Ireland who lived several years in Wisconsin and Minnesota before coming to Bismarck in 1881. He settled in Wild Rice Township and lived there until his death in 1919. Subsequent owners were heirs of Patrick Small: William Small, Robert P. Small, Adeline Small (Bird and Taylor 1972:59; Bauman and Jackson 1978:196-197). None of these persons appears to have been prominent in the history of the state, locality or nation, and archival sources do not indicate other historical significance in the site. This site is therefore not believed to be eligible for nomination to the National Register of Historic Places and no further research appears necessary.

32BL48

This site is a refuse dump in a small drainage cut. The integrity of the site is unknown. Artifacts and refuse in this dump may date from as early as the 1880's, but no evidence was observed that would indicate particular archeological potential for the site. The site does not appear likely to yield important cultural information, and archival sources do not indicate other possible historical significance for the site. This site is therefore not believed to be eligible for nomination to the National Register of Historic Places and no further research is recommended.

32BL50

This site appears to be either the remains of a small farmstead or outlying features of a larger farmstead located nearby. The site contains two small depressions, a poured concrete foundation of a dwelling, a poultry pen, and a pile of fence materials. The poured foundation indicates this site dates from after 1930 and probably after 1950. The site retains low integrity; buildings have been removed and the site has been disturbed through gravel digging operations. The site exhibits no indications of containing important cultural information. None of the persons associated with the title history appears to have been particularly important in local, state or national history, and archival sources do not indicate other historical significance for this site. This site is therefore not believed to be eligible for nomination to the National Register of Historic Places and no further research is recommended.

32BL51

This site consists of two historic depressions, two concentrations of refuse, and a general scatter of artifacts downslope from the concentrations. Artifacts include auto parts, battery parts, modern cans and bottles, cut lumber and unmilled poles, and aqua-tinted bottle glass. Artifacts observed on this site indicate the dump may have been in use for some time, possibly since the initial settlement period. The dump may have originally been associated with a farmstead shown to be in the vicinity on an 1892 General Land Office plat.

The integrity of this site is unknown. It does not appear to have been disturbed, except for continued dumping.

The property was patented to William Robidou (Homestead Certificate #1802). Robidou was born in Montreal and came to Bismarck with his family in 1878. The family lived in a log house on a bench near the woods until about 1887, when they moved into a frame house moved to the site. Robidou was an early supplier of water to residents of Bismarck (Bird and Taylor 1972:54,59,79; Bauman and Jackson 1978:194). Subsequent owners of the property were Gertrude Robidou, and James O. Robidou.

None of these persons appears to have been important in the history of the area, state or nation, and archival sources do not indicate other historical significance for the site. Artifacts observed on the site do not indicate any likelihood of this site to yield important cultural

information. This site is therefore not believed to be eligible for nomination to the National Register of Historic Places and no further research is recommended.

IF CRMOAHE-1

This isolated find is an auto body believed to date from approximately 1935.

CHAPTER SEVEN ANALYSIS

Analysis of Site Distribution Patterns

Introduction:

The following analysis was conducted in order to determine if certain types of site locations exhibit distinctive environmental/locational characteristics (in the following section, the term "site" is also used to refer to isolated find locations). If this is the case, then it should be possible to develop models which indicate the probability of there being a specific type of cultural resource at a specified location.

Several biases are present in the form of analysis which is presented below. The first of these is the belief that, in order to develop reliable models, site locations must be compared against inventoried areas where no sites have been recorded (i.e., nonsite locations). Without the use of nonsite locations, it can never be assumed the variability in site patterning is anything more than a reflection of the general environmental variability which exists within a given study area.

A second important bias is the assumption that separate types of sites should be treated as separate data categories in analysis. This stance was taken for several reasons. The first of these is that there is no present evidence to suggest that all prehistoric site localities should be "keyed" into the same set of environmental variables. If anything, just the opposite would seem more likely. As will be seen below, the desire to create as many valid site categories as possible had to be balanced against the equally important desire to keep the sample size within each analytical category from becoming excessively small.

The second reason for analyzing site types separately is that the earthlodge village sites, the first category used, is both a fairly uniform site type and one for which there have been, and will continue to be, specific research questions posed. If site patterning is observable using Plains Village occupation sites then the analysis is of extreme value, regardless of its utility when dealing with other types of sites.

Selection of Sample Units:

In order to have sufficient sample sizes of the cultural resources under study, it was necessary to group certain categories of sites which could normally be thought of as separate "types." The categories used in analysis are (a) earthlodge village sites, (b) other prehistoric sites, and (c) prehistoric isolated finds.

It should be pointed out that not all sites containing Plains Village ceramics were considered as village sites. Only those sites which had documented evidence of lodge features or exhibited extensive distributions of cultural material, which might indicate a village location, were included in the earthlodge village category. Fourteen sites met these criteria. They are 32BL1, 32BL5, 32BL46, 32EM1, 32EM6, 32EM10, 32EM11, 32EM79, 32EM80, 32EM100, 32EM101, 32EM112, 32EM125, and 32EM357. Although not all of these sites have been classified, their geographic location would indicate that the majority are probably Extended or Terminal Middle Missouri variant components (Lehmer 1971).

All other prehistoric site locations recorded during the 1983 inventory were grouped together into the second category. This amounted to 29 site locations. This category obviously contains a great variety of site types, from Woodland burial mounds to potential bison kill locations. One of the major questions to be asked during analysis, however, was whether or not village sites exhibit locational patterning distinctly different from other prehistoric localities along the river? This research orientation, as well as the fact that further subdivision would have resulted in very small category sizes, supports the combined grouping of these sites.

The third type of prehistoric cultural resource included in analysis is isolated finds. Twenty-one isolated find locations were utilized.

Each of these three prehistoric cultural resource categories was compared to 79 randomly selected locations at which no cultural resources have been recorded. These random points are the center of one-quarter mile long segments of the upper terrace, or bluff edge, along the valley. The width of these units varies somewhat due to changing widths of federal property along the upper terrace.

Since no prehistoric cultural resources were recorded in the bottom lands, these areas were excluded from the selection of nonsite locations. The sample was randomly selected from all possible one-quarter mile units within the survey area which do not contain recorded cultural resources.

Environmental Variables Used in Analysis:

A set of nine environmental/locational variables were measured at each of the 143 sample locations (i.e., 14 earthlodge villages, 29 other prehistoric sites, 21 prehistoric isolated finds, and 79 randomly selected nonsite locations). A tabular listing of these data is presented in Appendix E contained within Volume II of this report. The nine variables are:

Variable	Abbreviation used in tables
1. Distance to the Missouri River	DISTPE
2. Distance to closest tributary	DIST1
3. Distance to second closest tributary	DIST2

4.	Sinuosity Index of the Missouri River	SINUOS
5.	Maximum slope	SLOPE
6.	Aspect	ASPECT
7.	Area of tree cover	TREES
8.	Area of brush cover	BRUSH
9.	Distance to timber	DISTTI

Distance to the Missouri River, distance to the closest tributary, and distance to the second closest tributary were all measured by hand using an engineer's scale and topographic maps. Calculated distances are expressed in feet.

Although the entire survey area is relatively close to the old channel of the Missouri River, this distance does vary to a considerable degree. The distance to the Missouri River indicates a location's proximity to the most reliable water source and may also influence other characteristics of the setting such as timber availability, access to game trails, and overall environmental diversity of the location. Tributary drainages, when in close proximity to a sample point, provide added timber cover, greater vegetational diversity and increased topography to a particular setting.

Stream sinuosity is the ratio of channel length to down valley distance (Leopold et al. 1964:281). Since sinuosity of a stream channel influences vegetational and soil characteristics within a given length of valley bottom, it was believed that it might also have influenced the archeological patterning along the river. The center of the last mapped channel of the Missouri River prior to inundation was the stream route for which sinuosity was computed. A sinuosity index was calculated at the closest point on the river to each of the 143 sample points. The total channel length within a two mile (3.22 km) radius from that point on the river was measured. This distance was then divided by the minimum down valley distance (i.e., four miles, or 6.44 km) possible and this figure is used as the sinuosity index. Channel length was calculated using an analogue readout, map measuring device and 7.5 minute topographic maps.

Maximum slope was calculated for the random point or center of the site using topographic maps and a Reproduction Specialties, Inc. Land Area and Slope Indicator. Slope is expressed in percent grade. The surrounding slope of a location often indirectly indicates both topographic relief and the amount of flat surface available for occupation.

Aspect is defined as the measure of view spread from a given location (Kvamme 1981). View spread is an arc, measured in degrees, which extends downhill from the elevational contour line which passes through the location. Previous archeological studies (e.g., Sanders et al. 1982; Kvamme 1981) have indicated that the amount of view may have been a primary concern in the selection of prehistoric site locations. For purposes of the present study, size of the arc was determined by the maximum view extending out at least one-half mile (.80 km). Examples of aspects for

three locations are shown in Figure 7.1. Aspect was calculated using a 360 degree protractor and topographic maps.

Area of timber and area of brush were both calculated using a digital planimeter and 1947 Corps of Engineers maps for the Missouri River. The Corps maps show the locations of bottom land timber and brush prior to inundation. It has been suggested (e.g., Griffin 1977) that the amount of timber in an area may influence the location (and eventual movement) of Plains Village habitation sites along the river. The amount of timber and brush within a two mile (3.22 km) radius of a location was computed. These calculations were entered as square inches of map area. Since the maps used are at a scale of 1:24,000, one square inch of map area equals 91.83 acres, or 37.07 hectares. Distance to timber was also calculated using the same maps and an engineer's scale. These measurements were recorded in feet.

In addition to the above described environmental variables, Universal Transverse Mercator (UTM) coordinates were also recorded for each of the 143 sample points. Although not used in the current analysis, these coordinates provide a means of comparing the locations of each of the points to one another.

A number of other variables were recorded for each location but were not used in the analysis. Three direction measurements, in degrees, were computed (direction to the closest tributary, direction to the second tributary, and direction of slope). None of these was found to be useful, however, mainly because such types of measurements are not truly interval. As an example, a direction of slope measurement of 350 degrees is not actually 350 units "away from" a reading of 0 degrees, since the arc of the circle is swinging back toward the 0 degree reading. Such measurements are therefore not workable unless they are reduced to some type of nominal variable such as quadrants within a circle (e.g., NE, NW, SW, SE).

An attempt was also made to incorporate the soil types indicated for the sample locations (Stout et al. 1974; Wroblewski and Lunde 1980). However, the variation in soils descriptions between Burleigh and Emmons counties created inconsistencies which could not be adequately resolved. This left the accuracy of soil type codes highly questionable and, as a result, they were eliminated from the analysis.

Univariate Statistics:

Summary statistics for the environmental variables, by nonsite areas and site types, are given in Table 7.1. The information presented in these tables is critical to the remainder of the discussion presented in this chapter. Data concerning the range of measurement for each variable, as well as the measurement's distributional characteristics, are all summarized in the Table 7.1.

Figures 7.2 through 7.10 are histograms of distribution, by site types and the randomly selected nonsite locations, for the nine environmental variables under consideration. Because a normal distribution was not assumed for any of the variables, the nonparametric Kolmogorov-Smirnov test (Blalock 1972:262-265), rather than the more commonly used F statistic, was

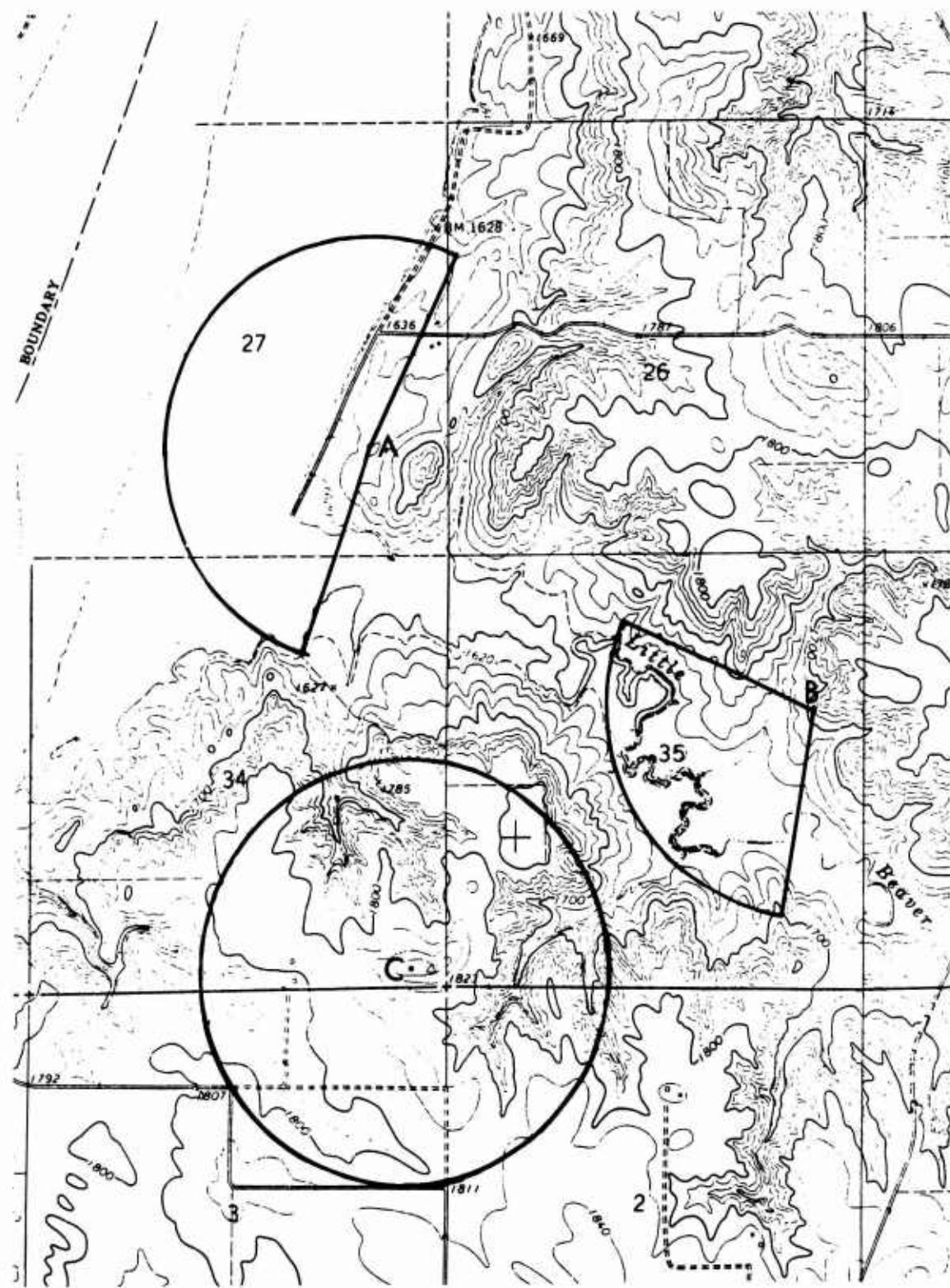


Figure 7.1. Examples of Aspect calculations; A = 187°, B = 86°, C = 360°.
 The calculation reflects the downhill view spread from a given point. Arc measurements are based on the position at which a one-quarter mile radius intersects the contour line passing through the location.

Table 7.1. Summary statistics for environmental variables.

	DISTPE	DIST1	DIST2	SINUOS	SLOPE	ASPECT	TREES	BRUSH	DISTTI
<u>RANDOM POINTS</u>									
N	79	79	79	79	79	79	79	79	79
NMISS	64	64	64	64	64	64	64	64	64
MEAN	4588	1884	4623	1.104	11.96	171.5	10.92	3.32	1535
MEDIAN	4800	1500	3700	1.048	10.50	180.0	9.30	3.25	1000
TMEAN	4414	1651	4339	1.092	11.67	173.7	10.50	3.28	1479
STDEV	2561	1869	3261	0.126	2.89	59.4	5.93	2.07	1343
SEMEAN	288	210	367	0.014	0.32	6.7	0.67	0.23	151
MAX	12700	9108	14888	1.468	19.25	303.8	28.78	8.78	4250
MIN	400	0	600	1.020	9.75	0.0	1.36	0.00	0
<u>EARTHLODGE VILLAGES</u>									
N	14	14	14	14	14	14	14	14	14
NMISS	129	129	129	129	129	129	129	129	129
MEAN	5886	2000	4229	1.119	12.96	218	13.7	3.91	1021
MEDIAN	5400	700	3550	1.048	11.00	220	13.3	3.90	750
TMEAN	5425	1642	4133	1.107	12.54	224	13.6	3.81	892
STDEV	4077	2784	2394	0.131	3.54	48	5.6	1.73	1071
SEMEAN	1090	723	640	0.035	0.95	11	1.5	0.46	286
MAX	16500	8200	9000	1.368	21.00	260	23.7	7.90	3500
MIN	800	100	600	1.020	10.00	100	5.2	1.12	100
<u>OTHER PREHISTORIC SITES</u>									
N	29	29	29	29	29	29	29	29	29
NMISS	114	114	114	114	114	114	114	114	114
MEAN	4414	1133	3072	1.056	10.97	202.9	8.63	3.70	1088
MEDIAN	4400	500	2700	1.020	10.25	205.0	8.13	3.87	1000
TMEAN	4259	939	2937	1.046	10.73	204.3	8.48	3.69	926
STDEV	2672	1549	1722	0.087	1.92	44.8	3.73	1.58	1337
SEMEAN	496	288	320	0.016	0.36	8.3	0.69	0.29	248
MAX	12500	7500	9000	1.368	18.25	280.0	18.25	6.30	6500
MIN	500	0	800	1.020	10.00	90.0	3.05	1.15	50
<u>ISOLATED FINDS</u>									
N	21	21	21	21	21	21	21	21	21
NMISS	122	122	122	122	122	122	122	122	122
MEAN	4129	1293	2900	1.0390	10.202	204.5	9.74	4.32	1002
MEDIAN	4800	1000	2800	1.0200	10.000	215.0	8.92	5.55	500
TMEAN	4137	1237	2850	1.0347	10.171	206.3	9.74	4.32	947
STDEV	1846	1041	1339	0.0319	0.302	45.4	3.41	2.24	1038
SEMEAN	403	227	292	0.0070	0.066	9.9	0.74	0.49	226
MAX	8100	3600	6000	1.1400	11.000	278.0	15.31	7.99	3000
MIN	3	100	600	1.0200	10.000	105.0	4.13	0.59	50

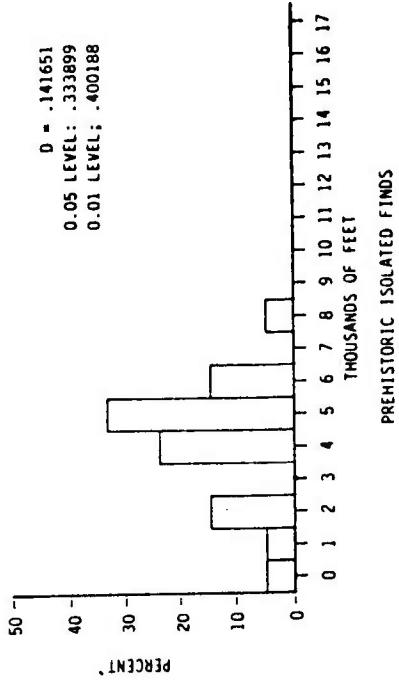
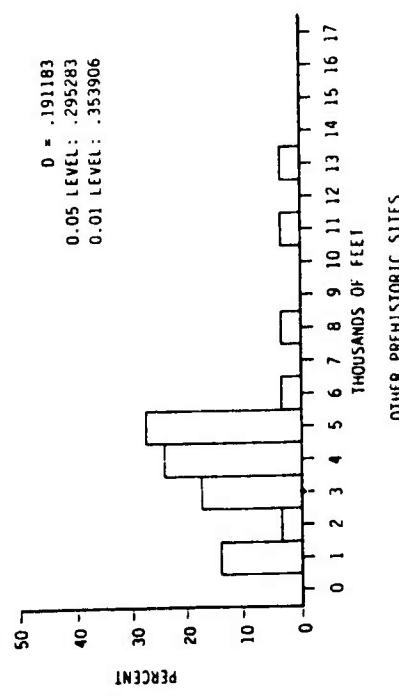
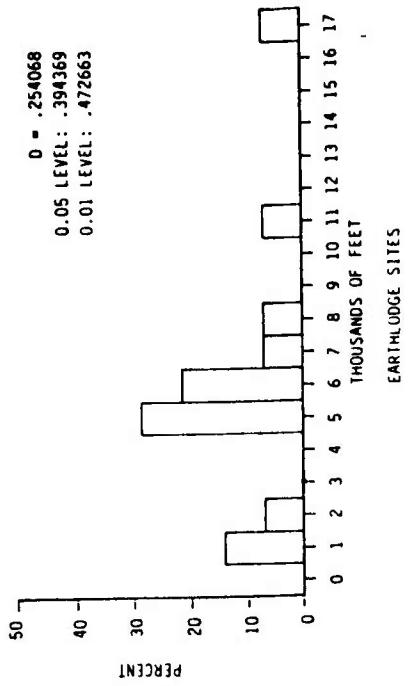
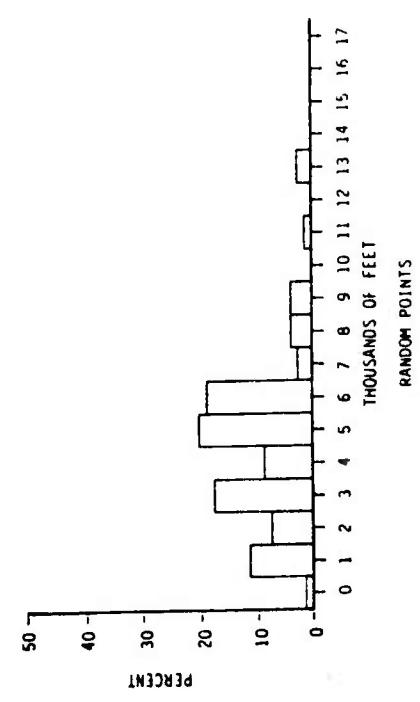


Figure 7.2. Histograms of the distribution of the Distance to Missouri River variable for random points (a), earthlodge villages (b), other prehistoric sites (c), and isolated finds (d).

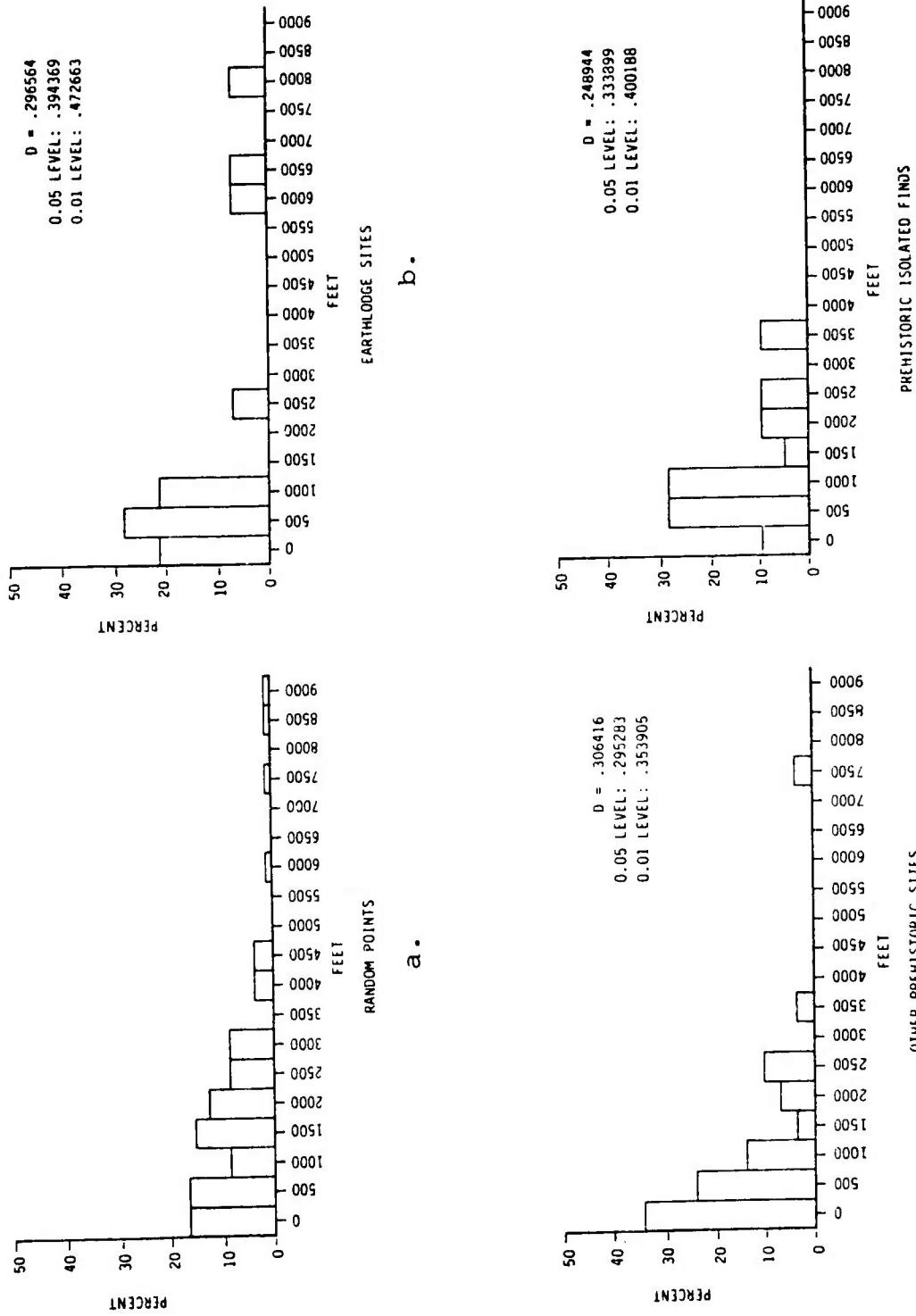


Figure 7.3. Histograms of the distribution of the Distance to closest tributary variable for random points (a), earthlodge villages (b), other prehistoric sites (c), and isolated finds (d).

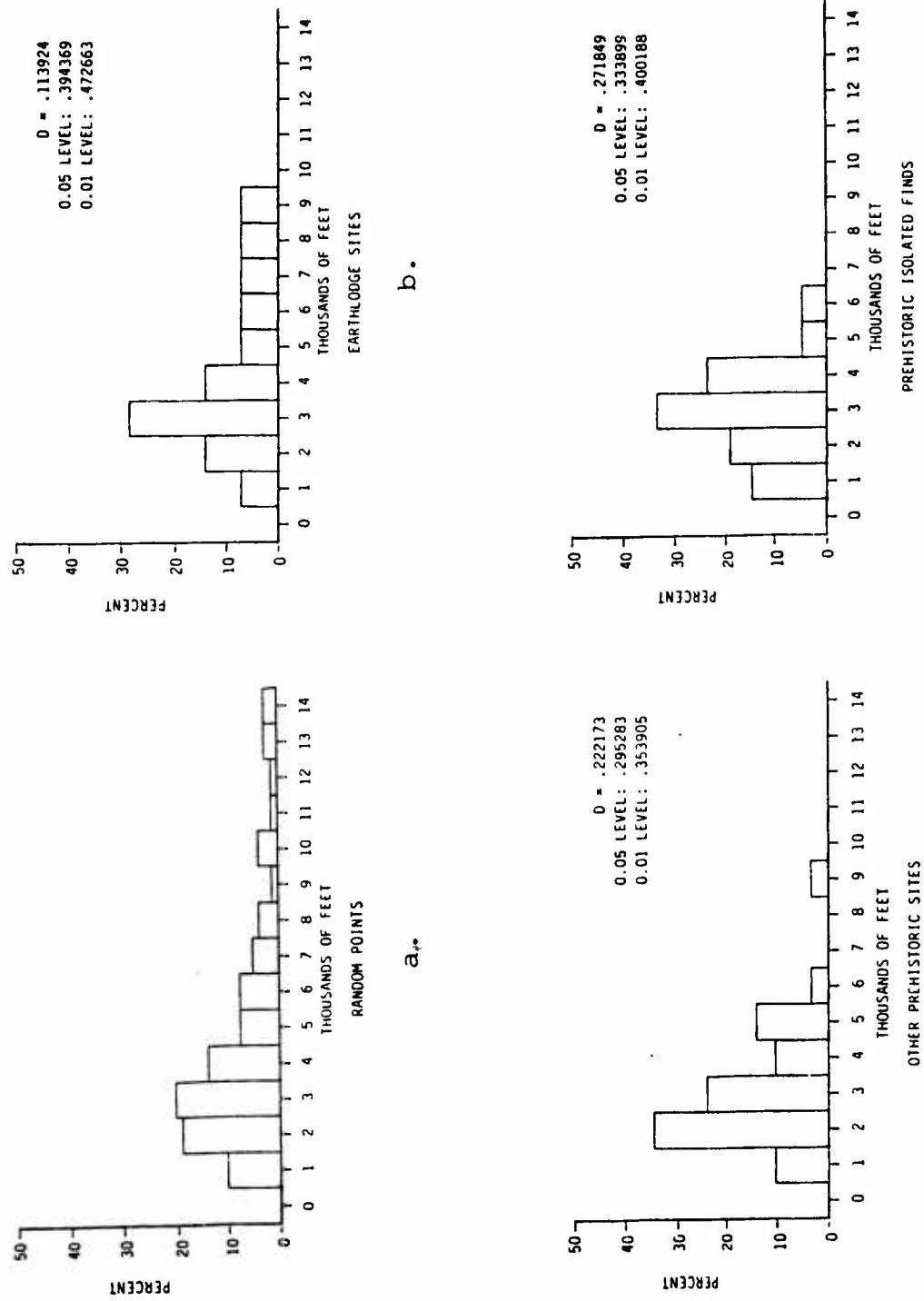


Figure 7.4. Histograms of the distribution of the Distance to second closest tributary variable for random points (a), earthlodge villages (b), other prehistoric sites (c), and isolated finds (d).

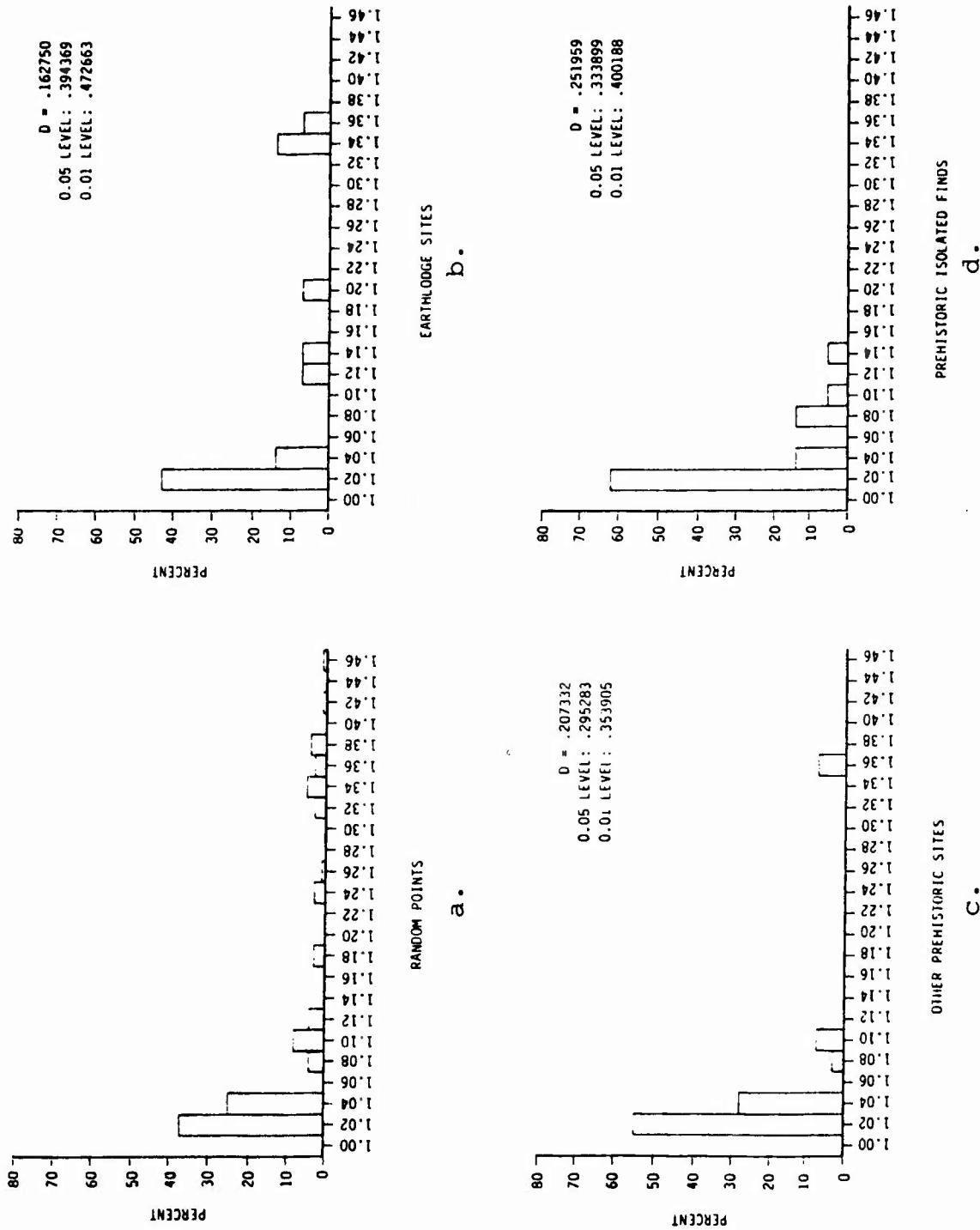
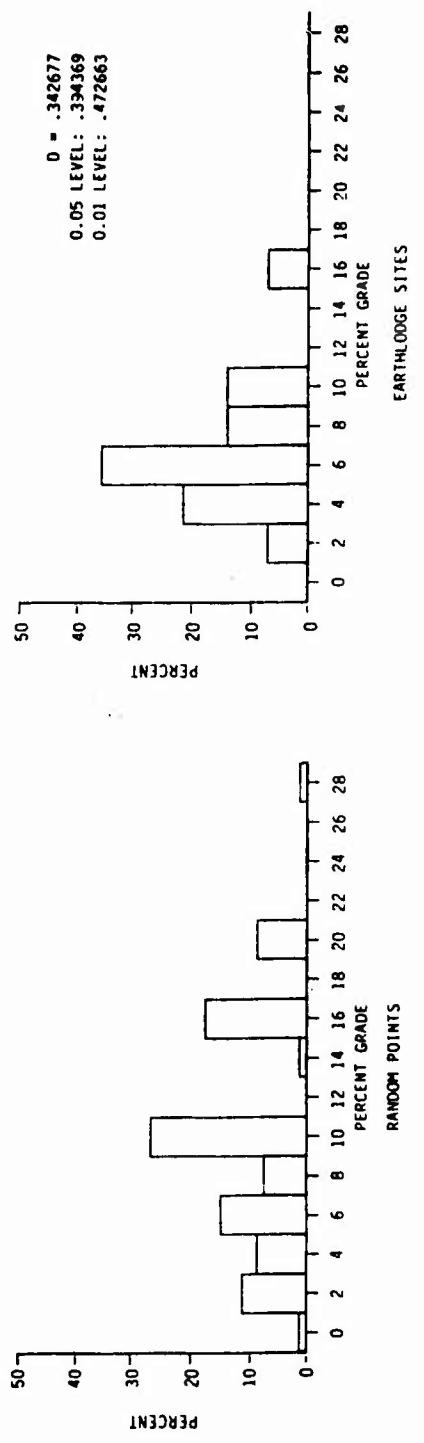
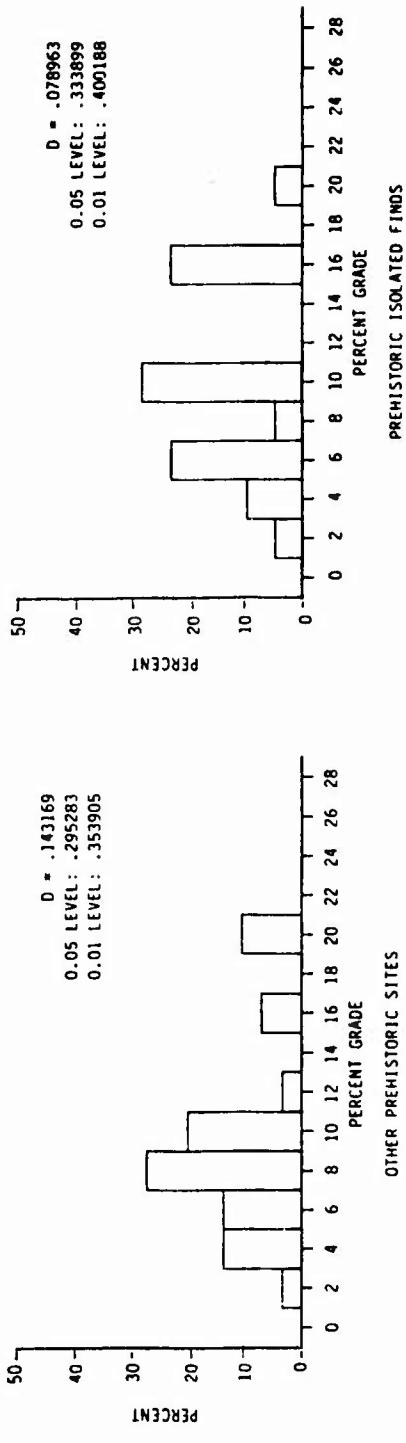


Figure 7.5. Histograms of the distribution of the Sinuosity Index variable for random points (a), earthlodge villages (b), other prehistoric sites (c), and isolated finds (d).



b.



d.

Figure 7.6. Histograms of the distribution of the Maximum slope variable for random points (a), earthlodge villages (b), other prehistoric sites (c), and isolated finds (d).

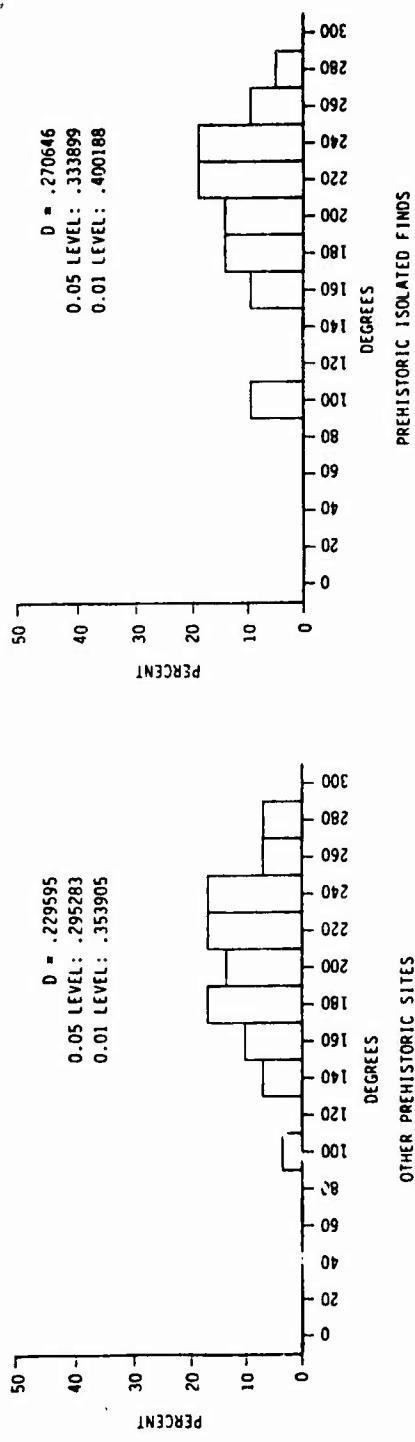
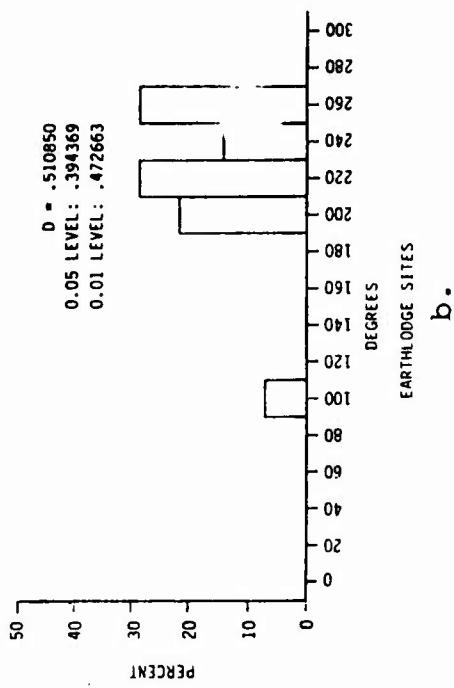
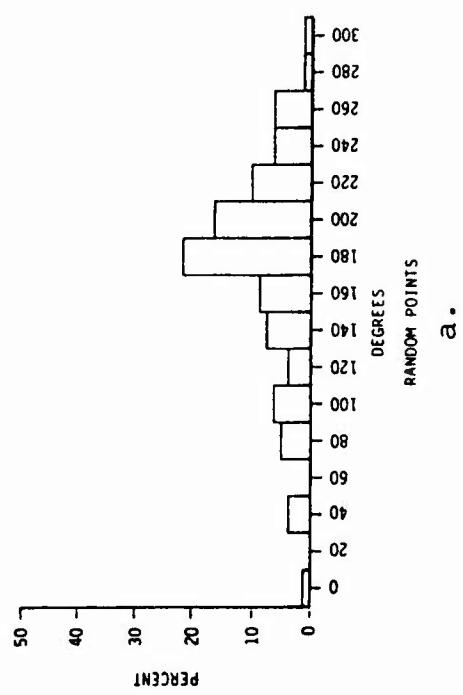


Figure 7.7. Histograms of the distribution of the Aspect variable for random points (a), earthlodge villages (b), other prehistoric sites (c), and isolated finds (d).

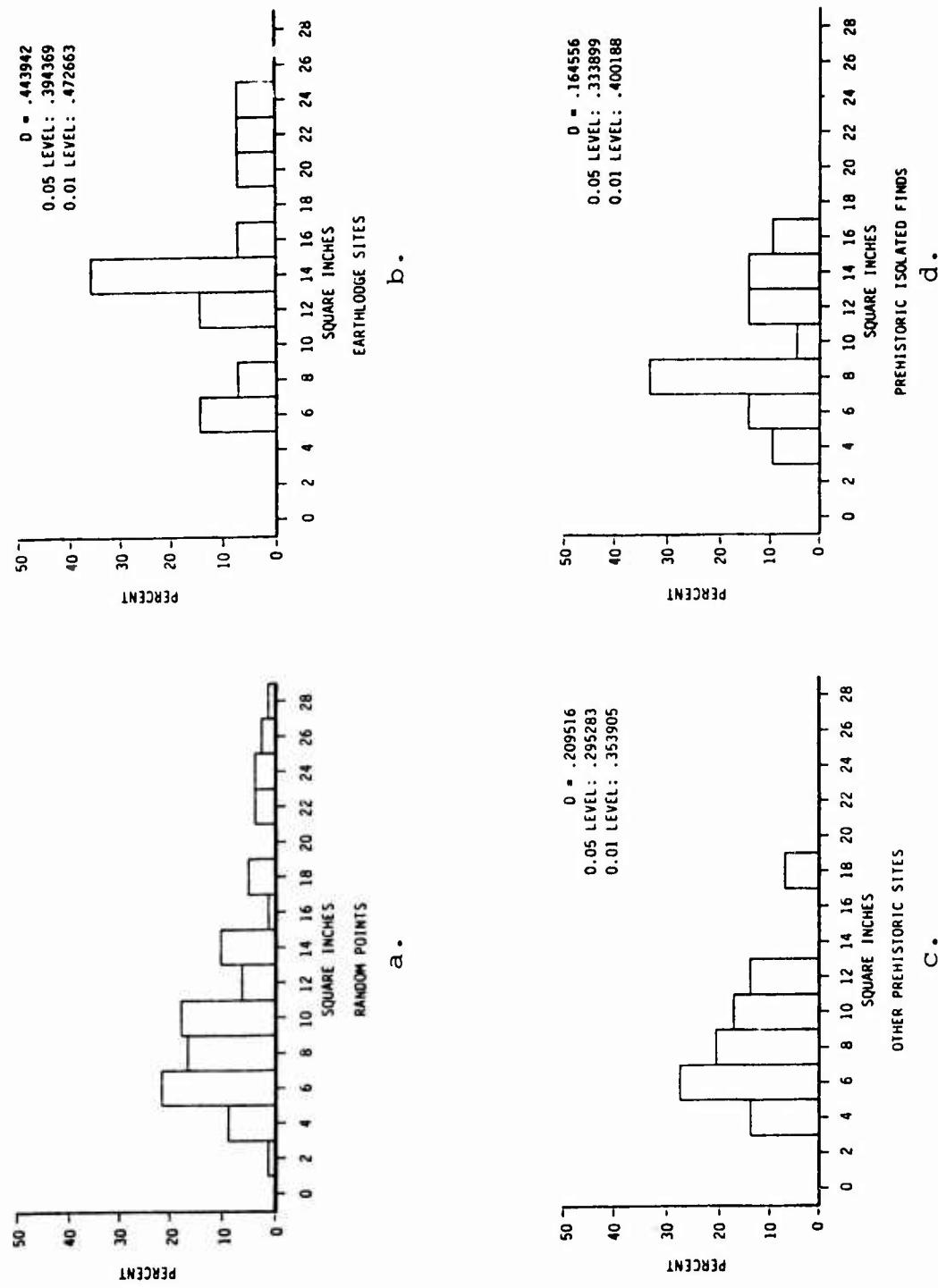
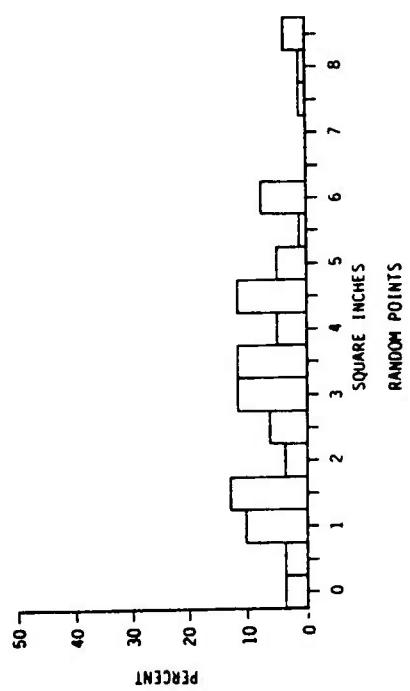
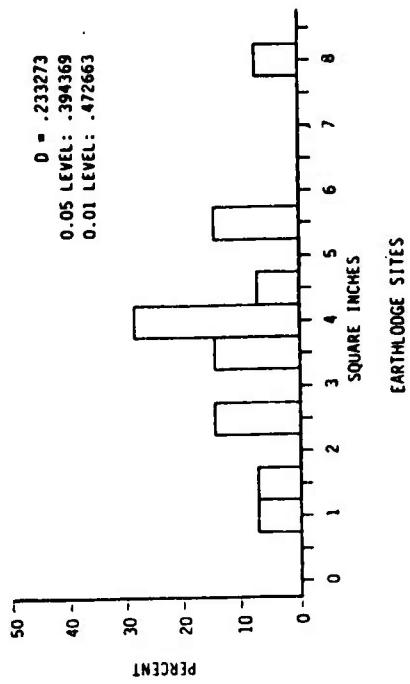


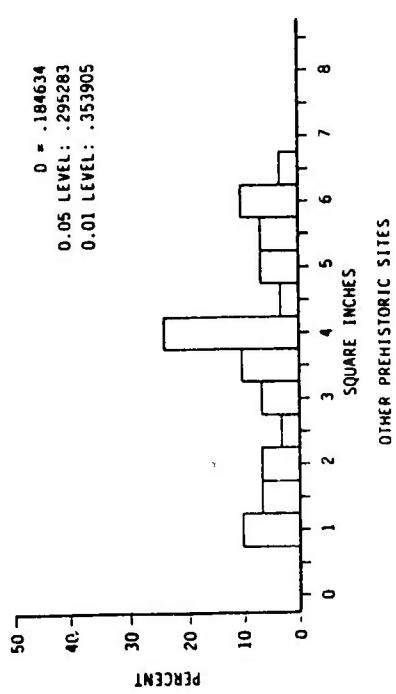
Figure 7.8. Histograms of the distribution of the Area of tree cover variable for random points (a), earthlodge villages (b), other prehistoric sites (c), and isolated finds (d).



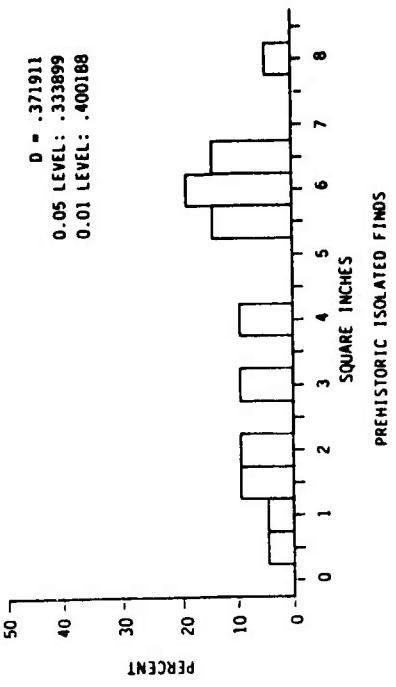
a.



b.

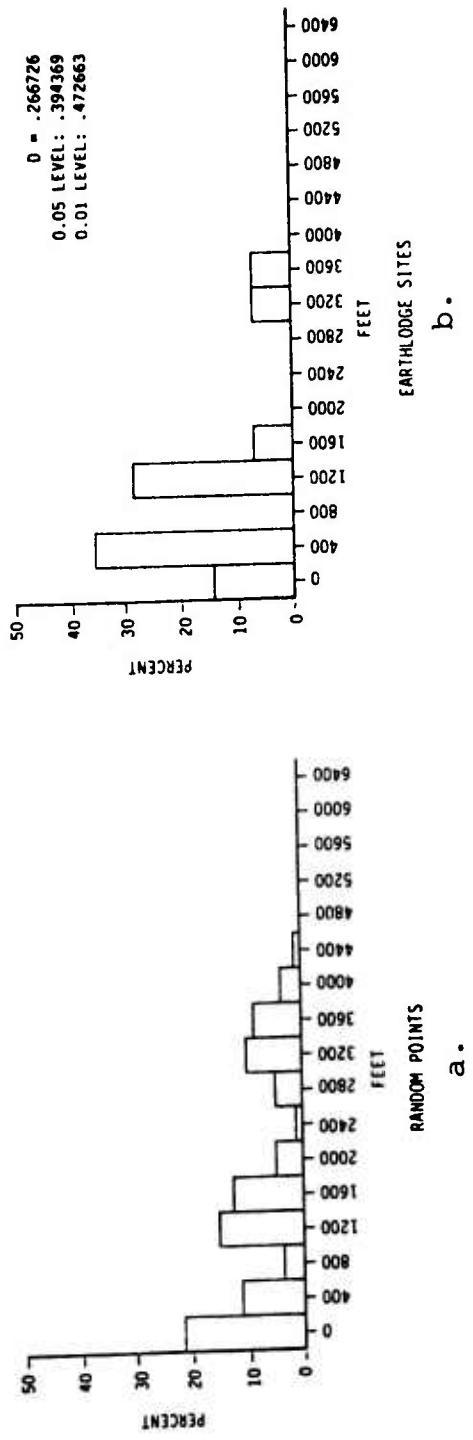


c.



d.

Figure 7.9. Histograms of the distribution of the Area of brush cover variable for random points (a), earthlodge villages (b), other prehistoric sites (c), and isolated finds (d).



d.

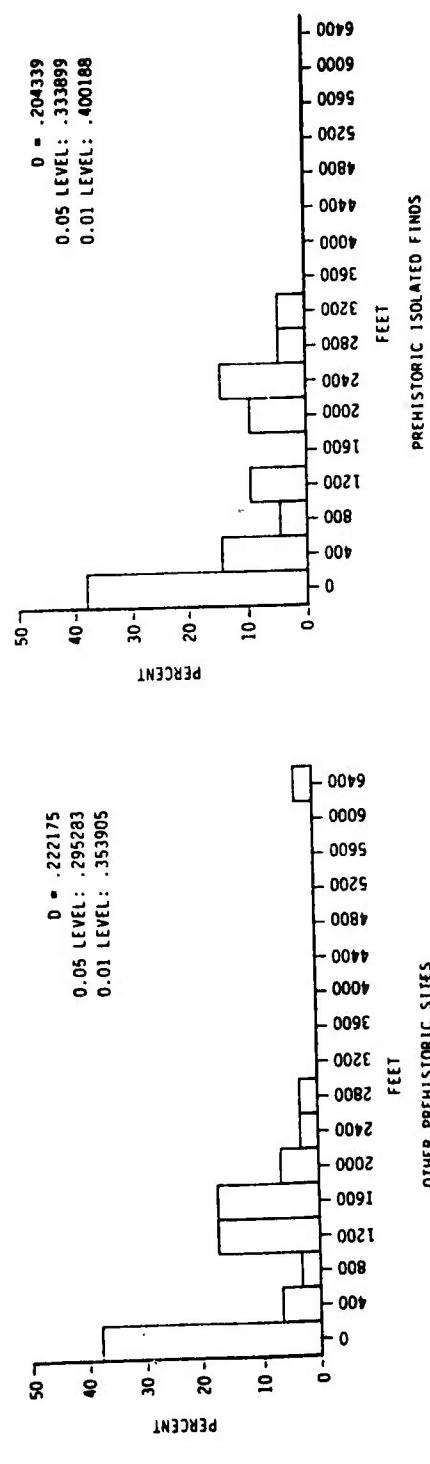


Figure 7.10. Histograms of the distribution of the Distance to timber variable for random points (a), earthlodge villages (b), other prehistoric sites (c), and isolated finds (d).

used to test the significance of distributional variation between nonsite locations (labelled "Random Points" in Figures 7.2 through 7.10) and the various site types (including isolated finds). The Kolmogorov-Smirnov (D) statistics are presented in Figures 7.2 through 7.10, along with the values of D necessary for significance at the .05 and .01 levels of null hypothesis rejection. At the .05 level, the Kolmogorov-Smirnov test indicates that values of the following variables are significantly different at the specified site type when compared against the values at nonsite locations:

<u>Variable</u>	<u>Site Type</u>	<u>Figure</u>
Distance to Closest Tributary	Other prehistoric sites	7.2c
Aspect	Earthlodge villages	7.6b
Trees	Earthlodge villages	7.7b
Brush	Isolated finds	7.8d

Although not up to the .05 level of significance, other variables at specific site types also seem to exhibit distinct differences when compared to nonsite locations (see Figures 7.2 through 7.10). The results of univariate analyses therefore tend to indicate that multivariate statistical techniques might be very useful in predicting site locations.

Nearest Neighbor Discriminant Analysis:

Nearest neighbor discriminant analysis is a nonparametric method of discriminant analysis which makes no assumptions about the distribution of the data (SAS Institute 1982:395). The procedure was applied to the three comparisons of site types to nonsite areas. Table 7.2 is a presentation of the results obtained from nearest neighbor discriminant analyses. The table also lists the specific environmental variables incorporated into each run of the statistic.

As can be seen from examination of Table 7.2, none of the models based on environmental information have less than 82.92 percent accuracy in predicting site and nonsite locations. Nearest neighbor discriminant analysis has some deficiencies when compared to other types of multivariate statistics which might have been used. Summary statistics are not presented which would allow the construction of a mathematical model to predict the probability of group membership (e.g., Klecka 1984:45-46) for an unsurveyed location. This problem can be overcome by entering the environmental variables for the unsurveyed location into a test data set to be used in the nearest neighbor discriminant analysis for each type of site. The unsurveyed location is coded as unknown to site type. For each run of the program, observations of unknown site type will be classified into the most likely category (i.e., site or nonsite location). Additionally, expanding from a calculation based only on the first nearest neighbor to one dealing with more than the first nearest neighbor (k value) produces results that specify the posterior probabilities of group membership (SAS

Table 7.2. Results of nearest neighbor discriminant analysis procedure
(0= randomly selected nonsite locations, 1 = site locations).

a) EARTHLODGE VILLAGES

Variables in model: Maximum Slope, Aspect, Area of Tree Cover.

	PREDICTED		ACTUAL
	0	1	
0	73 (92.41%)	6 (7.59%)	79
1	4 (28.57%)	10 (71.43%)	14

Overall accuracy of model = 82.92%

b) OTHER PREHISTORIC SITES

Variables in model: Distance to Closest Tributary, Aspect.

	PREDICTED		ACTUAL
	0	1	
0	66 (83.54%)	13 (16.46%)	79
1	2 (6.90%)	27 (93.10%)	29

Overall accuracy of model = 88.32%

c) ISOLATED FINDS

Variables used in model: Aspect, Area of Brush Cover.

	PREDICTED		ACTUAL
	0	1	
0	69 (87.34%)	10 (12.66%)	79
1	0 (0.00%)	21 (100%)	21

Overall accuracy of model = 93.67%

Institute 1982:397-404).

The limitations of nearest neighbor discriminant analysis must be balanced against the apparent strength, in predictive power, of the statistic. The utility of employing such techniques is discussed in the following chapter.

Research Questions Relating to Temporal Affiliation

A number of research questions were posed in Chapter Three which relate to information gathered on the temporal and cultural affiliation of prehistoric sites encountered during the 1983 Lake Oahe Inventory. These questions are repeated below along with any information which has been gathered that is an aid in answering them:

- 1) On both sides of the river, there appear to be two distinct clusters of Woodland sites, one between Huff and Fort Rice and another from Fort Yates south to the State line. Can these patterns be substantiated and, if so, what are their implications in terms of cultural adaptation to the area?

The distribution to Woodland sites and artifacts on the left bank of the Missouri River does not seem to indicate clustering of any type. Woodland materials were fairly dispersed and were found throughout the length of the 1983 survey area.

- 2) There is an obvious concentration of village sites (Extended Middle Missouri, Terminal Middle Missouri and Post-Contact Coalescent) in the northern portion of the Cannonball region and adjoining southern portion of the Knife-Heart region. Can the environmental factors influencing this settlement pattern be quantified?

Several different types of information have been gathered which shed some light on this question. As the statistical analyses presented above have shown, the amount of tree cover in the vicinity of a particular location does seem to have played a part in the selection of village site locations (see Figure 7.7b and Table 7.2b). These results support Griffin's (1977:182) hypothesis concerning village location:

It is my contention...that the availability of timber in the Middle Missouri Subarea is an important critical resource that should be considered when dealing with village location.

The northern segment of the survey area, starting at Bismarck and extending south for approximately 18 miles did have greater amounts of bottom land timber (prior to inundation) than other areas surveyed. It also has a higher density of village sites. It therefore appears that the amount of timber may be an environmental variable influencing the apparent high density of village sites in the northern portion of the Cannonball region.

Griffin has also suggested that certain types of timber were selected for by the village dwellers:

In addition, availability of particular sizes and kinds of trees, the result of stand age, location, and stream action, were important considerations for village residents in this area....I would propose that in order to most efficiently utilize timber in the immediate surroundings, villages would have located near young stands of timber whose constituent elements were dense, had relatively small boles, and were fairly straight...[Griffin 1977:182-183].

This description compares favorably with the young cottonwood forests, part of the Cottonwood Forest community discussed in the Vegetation section in Chapter Two. By far, the vast majority of young cottonwood forests are (or were) found near the northern end of the survey area.

These hints at environmental patterning of village sites must be tempered by another factor concerning the northern end of the survey area. If one examines maps of the area survey (e.g., Figure 1.1), it becomes clear that, for every mile of north to south distance, there is much more bluff edge available in the northern one-third of the survey area than there is in the southern two-thirds. When this factor was taken into account, it was found that there is really very little, if any, greater density of village sites per mile of bluff edge in the northern portion of the survey area.

- 3) The literature indicates the historic Arikara used the study area as part of their hunting territory. Can such camps be found and identified?

Only one historic Native American artifact (see Figure 6.4a) was recovered during the 1983 inventory. While that artifact is a projectile point and is probably indicative of hunting activity, its tribal affinity is unknown. While the artifact could be Arikara, it is just as likely related to later Dakota use of the area.

- 4) Can the purported Yanktonai villages which may have existed in the southern portion of the study area be found and identified?

A number of sites encountered during the 1983 inventory produced ceramics which do not appear to be typical of the Riggs and Fort Yates wares which might be expected for the area. Most of these ceramics are very small body sherds, however, and are not overly diagnostic. The most striking characteristic of these artifacts is the presence of what appears to be shallow trailed designs on the exterior surface of the vessels. Several of the designs appear to have been curvilinear but, again, the sherd sizes were too small to get a good impression of the total design. Whether these artifacts might relate to Yanktonai occupation of the area (or whether the Yanktonai even used pottery) is still an unanswered question. The finds do seem to point out a greater diversity in Plains Village ceramics in the region than had previously been described.

- 5) In addition to Arikara hunting camps, can other "extra-village activity areas" (e.g., Steinacker 1981:93) be located and, if so, which traditions and variants will they be related to?

The majority of the "other prehistoric sites" category utilized in the analyses presented above appear to be small, perhaps single event, loci. Many of these are probably short term special activity areas. The same is probably the case for most of the isolated finds recorded. Temporal diagnostics recovered indicate that these Native American localities range in age from the Early Plains Archaic to the Historic Period. In many cases, the cultural affiliation and types of activities that occurred at these locations cannot be accurately determined without subsurface testing.

- 6) Do site attributes such as site size and ceramic assemblages bear out the usual interpretation that, in the upper Cannonball region, all village sites which are small and unfortified are from the Extended Middle Missouri variant, while all sites from the Terminal Middle Missouri variant are large and fortified (e.g., Thiessen 1976; Sperry 1982)?

Since no new fortified village sites were recorded during the 1983 survey, this question remains unanswered. The quantity of identifiable ceramics recovered is also insufficient to add very much new data relating to this question. It is likely that subsurface testing, excavation, dating and detailed ceramic analysis at the village sites recorded during 1983 would aid greatly in the interpretation of the interrelationships between the Terminal and Extended Middle Missouri variants.

CHAPTER EIGHT SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Density of Cultural Properties

As stated in Chapter One, it is estimated that approximately 8200 acres of federal land were inventoried during the 1983 Lake Oahe inventory. A total of 72 sites and 23 isolated finds were recorded. This equates to 7.34 cultural resource properties per section (640 acres) of inventory.

The above acreage figures include approximately 1696 acres of sampled bottom land, within which only one site was recorded. If this acreage and the single site are removed from the calculations, the density figures go up considerably. These corrected figures, for only the upper terraces subjected to one hundred per cent inventory, equate to 9.15 cultural resource properties per section of inventory.

The results of bottom land inventory tend to support the original opinion of Corps of Engineers personnel that site densities are extremely low in these regions (only one site in 2.65 sections of land). The single historic site recorded was also evaluated as ineligible for nomination to the National Register of Historic Places.

The results indicate that prehistoric materials will rarely, if ever, be found in the bottoms. It is therefore recommended that future sampling of these types of areas be oriented toward those historic resources which may exist in the bottoms. General Land Office plats should be consulted for indications of historic habitation areas. These locations could then be inventoried to determine if any artifactual or structural remains are present. It is also recommended that 40 to 80 acres of land around these locations be inventoried. This would guard against any inaccuracies in location which may exist on the original map. The additional inventory would also sample for other types of cultural resources, such as prehistoric sites. While such a strategy is by no means statistically unbiased, it is believed that it would record the optimum number of sites possible using sampling.

Types of Cultural Resource Components Represented

Table 8.1 is a categorization of the types of cultural components represented at the 72 sites recorded. Using the categories in Table 8.1, a total of 81 components are represented at the 72 sites. It should be noted, however, that a number of sites listed under "unknown prehistoric" have more than one recognizable cultural level present. Since the age and interrelationships of these levels are not yet known such sites were coded as having only one recognized component. Additionally, it is believed that subsurface testing efforts, especially at some of the Plains Village sites,

Table 8.1. Cultural components recognized within the sites recorded.

	<i>HISTORIC FARMSTEAD</i>	<i>HISTORIC REFUSE</i>	<i>PLAINS VILLAGE</i>	<i>LATE PREHISTORIC</i>	<i>LATE WOODLAND</i>	<i>MIDDLE WOODLAND/</i> <i>LATE ARCHAIC</i>	<i>EARLY & MIDDLE</i> <i>ARCHAIC</i>	<i>UNKNOWN PREHISTORIC</i>
32BL1				X				
32BL5	X		X	X				
32BL46	X		X					
32BL47	X	X						
32BL48		X						
32BL49		X						
32BL50	X							
32BL51	X							
32BL52	X							
32EM1			X					
32EM6			X					
32EM7			X					
32EM10			X					
32EM11			X					
32EM19							X	
32EM21					X			
32EM30			X		X	X		
32EM73				X				X
32EM77					X			X
32EM78			X			X		
32EM79			X		X			
32EM80				X				
32EM81							X	
32EM82			X					
32EM83		X						
32EM84		X						
32EM85		X						
32EM86			X					
32EM87			X					
32EM88							X	
32EM89		X						
32EM90		X						
32EM91		X						
32EM92			X					
32EM93		X						
32EM94							X	
32EM95						X		
32EM96		X						
32EM97				X		X		
32EM98								
32EM99								
32EM100								
32EM101			X					
32EM109	X							

Table 8.1 (cont.). Cultural components recognized within the sites recorded.

	HISTORIC FARMSTEAD	HISTORIC REFUSE	PLAINS VILLAGE	LATE PREHISTORIC	LATE WOODLAND	MIDDLE WOODLAND/ LATE ARCHAIC	EARLY & MIDDLE ARCHAIC	UNKNOWN PREHISTORIC
32EM110	X							
32EM111	X							
32EM112	X		X		X			X
32EM113								X
32EM114							X	X
32EM115							X	X
32EM116							X	X
32EM117							X	
32EM118		X					X	
32EM119								X
32EM120		X						
32EM121		X						
32EM122		X						X
32EM123			X					
32EM124			X					X
32EM125			X					
32EM126			X					X
32EM202								X
32EM203							X	X
32EM353			X					
32EM354				X				
32EM357					X			
32EM360								
32EM362		X						
32EM363		X						
32EM364		X						
32EM366		X						
32EM368			X					

29 7 14 2 1 7 2 19

Total number of components = 81

would more than likely identify additional components.

In addition, two temporally diagnostic isolated finds were recorded. IF LTA1383-10 is an iron projectile point (see Figure 6.4a) and IF LTA1383-11 is a possible Early Plains Archaic projectile point (see Figure 6.5c).

Sites Believed Eligible for Nomination to the National Register of Historic Places

Of the 72 recorded sites, it is believed that sufficient data are available to state that seven (32EM1, ,32EM7, 32EM10, 32EM21, 32EM30, 32EM112 and 32BL5) are eligible for nomination to the National Register of Historic Places. Of these six, 32EM1 (Havens), 32EM10 (Shermer), and 32BL5 (Holbrook) have been categorized by Lehmer (1971) as either Extended or Terminal Middle Missouri village sites. The Badger Ferry site, 32EM7, is also believed to be a Middle Missouri component. A newly recorded site, 32EM112, also exhibits subsurface features which are likely Middle Missouri lodges. As such, all four of these sites offer the opportunity to gather information on several current research topics relating to village sites in the Middle Missouri subarea:

Studies of intra-site utilization patterns need to be developed. Such studies would identify spatially associated tool classes and related debris classes, and would identify activity areas within, around, and among specific dwelling units in an earthlodge village....Spatial aspects of tool manufacture, utilization, curation, recycling, and disposal should be determined; the procurement, processing, storage, and consumption patterns should be developed for consumable elements in the prehistoric cultural systems.

The character of subsistence activities associated with specific villages and time periods should be determined, and an explicit evaluation of the hypothesis of subsistence stability through time should be made. Seasons of occupation should be determined, and quantified estimates of relative dependence on multiple animal resources, cultigens and gathered plant foods should be made through controlled recovery and detailed analysis of relevant debris classes. The question of environmental change in the Middle Missouri subarea should be examined through intensive analysis of microfaunal and botanical materials, including pollen, and the dynamic relationship between subsistence strategies and environment should be studied (cf. Lehmer 1970).

The relationship between intra-village stylistic variability and inter-village stylistic variability should be quantified. In such a study, stylistic variability in both male-related and female-related classes of material culture should be examined independently, and taxonomic classifications in the Middle Missouri subarea should be re-evaluated accordingly [Ahler 1977:147].

These three areas of archeological research are fairly general and could essentially be explored at any or all intact village sites within the

Middle Missouri subarea. When dealing with the Middle Missouri tradition in the Cannonball region, however, the sites listed above are in a chronological and geographic position to be of more specific interest.

The Middle Missouri tradition is divided into three sequential variants: Initial Middle Missouri (A.D. 900-1400), Extended Middle Missouri (A.D. 1100-1550) and Terminal Middle Missouri (A.D. 1550-1675). The Cannonball region is believed to contain only the latter two of these variants. Within the Cannonball region, the traditional characteristics which have been used to distinguish Terminal Middle Missouri sites from the earlier Extended Middle Missouri sites are larger village size, the presence of fortifications and higher proportions of Fort Yates ware in the ceramic assemblage (Lehmer 1971:121-124). Additional studies of sites in the Cannonball region have demonstrated that fortifications are not exclusively a Terminal Middle Missouri trait but are also present at sites now believed to be components of the Extended variant (Falk and Calabrese 1973; Ahler 1977; see also Calabrese 1972:39).

Concerning the transition from the Extended to the Terminal variant, there are generally two hypotheses:

- 1) Settlement patterns, subsistence systems, and technological systems were in essentially stable equilibrium from the time the Northern Plains was first settled by representatives of the Plains Village pattern....Stability in settlement patterning does not necessarily carry with it stability in community patterning. Villages assumed many forms in the Northern Plains, from open and dispersed to fortified and compact. That is, community patterning was modified by contact with outside populations, with attendant modification of internal social systems, but the overall disposition of sites and activities over the landscape seems not to have been changed [Wood 1974:3, 8].
- 2) The Cannonball sequence as depicted...clearly suggests that a gap exists in the occupational record for that region on approximately the same time level as a similar hiatus postulated for the Bad-Cheyenne Region. If this gap is relatively accurate reflection of the intensity of prehistoric inhabitation of the Cannonball Region during the fourteenth century A.D., a need exists to reassess the currently accepted taxonomic structure for the Cannonball Region, a construct which has been established on the assumption of uninterrupted occupation of the region by aboriginal groups from Extended Middle Missouri through Post-Contact Coalescent times [Thiessen 1976:163-164].

It is believed that village sites 32EM1, 32EM7, 32EM10, 32EM112 and 32BL5 have the integrity and content to address all of these research questions. Two of the sites, 32EM1 (Sperry 1982) and 32EM10 (Sperry 1968) have already been subjected to considerable amounts of excavation and have been dated. However there are large portions of both sites remaining and it is believed that both could contribute further significant information concerning the research questions posed above.

Sites 32BL5, 32EM7 and 32EM112 have not been excavated. Bank exposures and surface features indicate that at least portions of an intact cultural

level remain all three. It is believed that these sites also have the integrity and content necessary to address the above research topics.

Site 32EM30 appears to contain stratified prehistoric materials. At least two cultural levels were observed in the cutbank at 32EM30. Hearth features, bone concentrations, and chipped stone lithics were observed within these levels. Diagnostics found on the surface of the site indicate the presence of McKean and Besant materials. Smooth, grit tempered body sherds were also found which may indicate a Plains Village component.

Woodland and Archaic occupation sites in the Cannonball region are still comparatively rare. Even fewer have been adequately investigated. The presence of such deposits in what appears to be a stratified context at 32EM30 offers the opportunity to investigate subsistence patterns, environmental conditions, lithic technology and cultural patterning of pre-Plains Village inhabitants of the Middle Missouri subarea.

The final site believed eligible for nomination to the National Register of Historic Places is 32EM21. Excavations were carried out at this site by the University of North Dakota in 1980 (Root and Gregg 1983b). These excavations reveal an extensive level of cultural material dated at AD 20 ± 100 years. The original recorders of the site stated that 32EM21 was eligible for nomination to the National Register of Historic Places. Since much of the site remains unexcavated and obviously has the potential to yield significant information concerning the prehistory of the Cannonball region, it is assumed that 32EM21 can still be considered eligible for nomination to the National Register of Historic Places. This assessment must be based primarily on the previous excavations of the site since very few cultural materials were visible when it was visited by the Larson-Tibesar crew in 1983.

Recommendations for Sites of Undetermined Eligibility

As already stated, seven of the sites recorded during the 1983 inventory are believed eligible for nomination to the National Register of Historic Places. Of the remaining 65 sites, it is believed that further work is needed to determine eligibility at 29. None of the 23 isolated finds recorded are considered eligible for nomination.

Table 8.2 is a listing of the sites for which further work is recommended. The table also contains recommendations concerning the type of work which needs to be carried out in order to make a determination of eligibility. Although most recommendations concern subsurface archeological testing, it should be noted that further surface collections, additional regional synthesis, and detailed archival research are also needed to assess eligibility at certain localities.

Impacts to Sites

The following assessment of impacts to the sites recorded addresses only those portions of the site on federal surface. While many of the cultural resources extend into private land, examination of those portions

Table 8.2. Recommendations for further work to assess National Register eligibility.

- 32BL1 Testing to substantiate the presence of lodge features and to determine the nature and quantity of cultural material.
- 32BL46 Testing below an old plow zone and along the terrace edge to recover a better ceramic sample, date the site, explore for features and assess integrity.
- 32EM6 Testing of the levels exposed in the cutbank of the site to determine their age, extent and integrity.
- 32EM11 Testing to determine the age and function of the cultural deposits.
- 32EM73 Testing to determine the age, content and integrity of the cultural deposits.
- 32EM77 Testing to determine the age, content and integrity of the cultural deposits.
- 32EM78 Testing to determine if the mound feature is cultural and to assess the integrity of cultural materials present near the cutbank.
- 32EM79 Testing below the plow zone to determine if features and in situ cultural deposits are present and to determine the exact age and nature of the site.
- 32EM80 Testing to determine the integrity and extent of the site on federal surface.
- 32EM81 Testing to determine if any of the materials exposed in the cutbank are in situ.
- 32EM85 Formulate research questions relating to historic farmsteads in the region and conduct subsurface testing.
- 32EM88 Mechanical testing to investigate and determine the age and extent of the deeply buried cultural deposits.
- 32EM89 Formulate research questions relating to historic farmsteads in the region and conduct subsurface testing to determine the nature of the circular depression at the site.
- 32EM90 Assess the significance of the portion of the site which is on private land and relate this to the historic deposits encountered on federal surface.
- 32EM94 Testing of the mud flats area of the site to determine if in situ cultural materials are present.
- 32EM95 Testing in "area A" to determine if the mound is actually a cultural feature and to determine the integrity of the surrounding deposits.

Table 8.2 (cont.). Recommendations for further work to assess National Register eligibility.

- 32EM96 Formulate research questions relating to historic farmsteads in the region and conduct subsurface testing.
- 32EM97 Testing to determine the east to west extent of cultural deposits and access their age and integrity.
- 32EM98 Excavate the exposed bison skulls and test the surrounding area for the presence of an intact, datable bone level or occupation area.
- 32EM99 Excavate and date any exposed hearth features and perform additional testing to determine the age and integrity of the stratified deposits.
- 32EM100 Testing to determine the age and extent of the cultural deposits and investigate the possible relationships of this site to the previously recorded 32EM7.
- 32EM101 Testing to determine the age and extent of the remaining cultural deposits.
- 32EM114 Subsurface testing using rather large, shallow test units to examine the integrity and spatial patterning of the cultural deposits.
- 32EM116 Excavation and dating of any exposed hearth features as well as additional test units to determine the extent of the site.
- 32EM117 Visitation to the site during a low water period and test excavations to determine if in situ deposits are present.
- 32EM118 Detailed oral history interviews and further archival documentation in order to identify the function, period of occupation and former occupants of the site and assess how much of it may remain intact.
- 32EM125 Subsurface testing and additional collection of surface materials to determine the age, extent and integrity of the site.
- 32EM354 Hand testing and mechanical testing are recommended to determine the nature and extent of buried deposits.

of the site were generally too limited to accurately assess impact.

Table 8.3 lists the adverse impacts noted at 41 of the 72 recorded sites within the study area. While a certain amount of vandalism and other types of impacts have occurred at some of the sites recorded, by far the greatest impact noted is destruction of the cultural deposits through bank erosion of Lake Oahe (see Table 8.3). This is particularly true of the sites located in the southern one-half of the project area. Sites in the northern segment generally appear to be more stable and farther removed from the waters of Lake Oahe. At the Shermer site (32EM10), for instance, no evidence of damage due to lake levels could be seen.

In many cases, information concerning previously recorded sites is not specific enough to estimate original site size; thus the amount of the site which has been destroyed cannot be calculated. If several instances, however, a considerable amount of usable information is available.

Figure 8.1 is a photo of an active slump block at 32EM81. Although the significance of this site is presently unknown, it is estimated that there are at least 1500 square meters of site area within the slump block. There are no indications of earlier bank exposures of this site and very little evidence of cultural materials in the stable ground to the east of the slump block. This site therefore appears to have become exposed and is now in great danger of total destruction, all within a very short time span.

An even more graphic example of bank erosion is present at the Havens site, 32EM1. A 1967 map of the site (Sperry 1982), information from 1981 aerial photos of the site, and the 1983 Larson-Tibesar map of the site were all combined in Figure 8.2 to demonstrate the rate of bank erosion occurring at 32EM1. These data indicate that the shoreline is collapsing laterally at an average rate of 7.5 meters per year.

The maps also indicate that at least 2569 square meters of unexcavated floor area from 23 features have been destroyed by bank erosion since Sperry mapped the site in 1967. Ahler (1977:141) has presented data from the Jake White Bull site, 39C06, which indicate that the following densities of major tool and artifact classes might be expected from a Middle Missouri lodge:

Classifiable Ceramic Vessels	4.12/sq. meter
Shell Beads, Bead Manufacturing Debris	3.76/sq. meter
Bone Tools, Ornaments, Tool Manufacturing Debris	4.01/sq. meter
Patterned Chipped Stone Tools	4.32/sq. meter
Unpatterned Chipped Stone Tools	9.78/sq. meter
Ground Stone Tools	2.65/sq. meter
Identifiable Vertebrate Faunal Elements	16.24/sq. meter

These counts equate to 44.88 major artifacts per one square meter of house floor. Using this figure, it is estimated that over 115,000 artifacts have

Table 8.3. Impacts to sites.

32BL5	Past cultivation, natural erosion
32BL46	Past cultivation, wind erosion
32EM1	Bank erosion, vandalism, vehicle traffic
32EM6	Bank erosion
32EM7	Extensive gravel operations
32EM10	Vehicle traffic
32EM11	Past construction, past cultivation, vehicle traffic
32EM19	Pipeline construction, cultivation
32EM21	Pipeline construction, access road, cultivation
32EM30	Bank erosion
32EM73	Bank erosion
32EM77	Bank erosion
32EM78	Vehicle traffic, bank erosion
32EM79	Bank erosion, past cultivation, past construction activities, vehicle traffic
32EM80	Bank erosion, vehicle traffic
32EM81	Active slumping, bank erosion
32EM88	Bank erosion
32EM94	Bank erosion
32EM95	Bank erosion
32EM96	Vandalism
32EM97	Bank erosion
32EM98	Natural erosion
32EM99	Bank erosion
32EM100	Gravel operations, water pipeline, bank erosion
32EM101	Bank erosion
32EM109	Periodic inundation
32EM112	Bank erosion
32EM113	Bank erosion
32EM114	Bank erosion
32EM115	Bank erosion
32EM116	Bank erosion
32EM117	Bank erosion
32EM118	Bank erosion
32EM119	Bank erosion, vehicle traffic
32EM121	Bank erosion
32EM125	Bank erosion
32EM202	Bank erosion, vehicle traffic
32EM203	Vehicle traffic, bank erosion, shelter belt
32EM354	Bank erosion, periodic inundation
32EM363	Cultivation, bank erosion
32EM368	Bank erosion



Figure 8.1. Slump block at 32EM81.

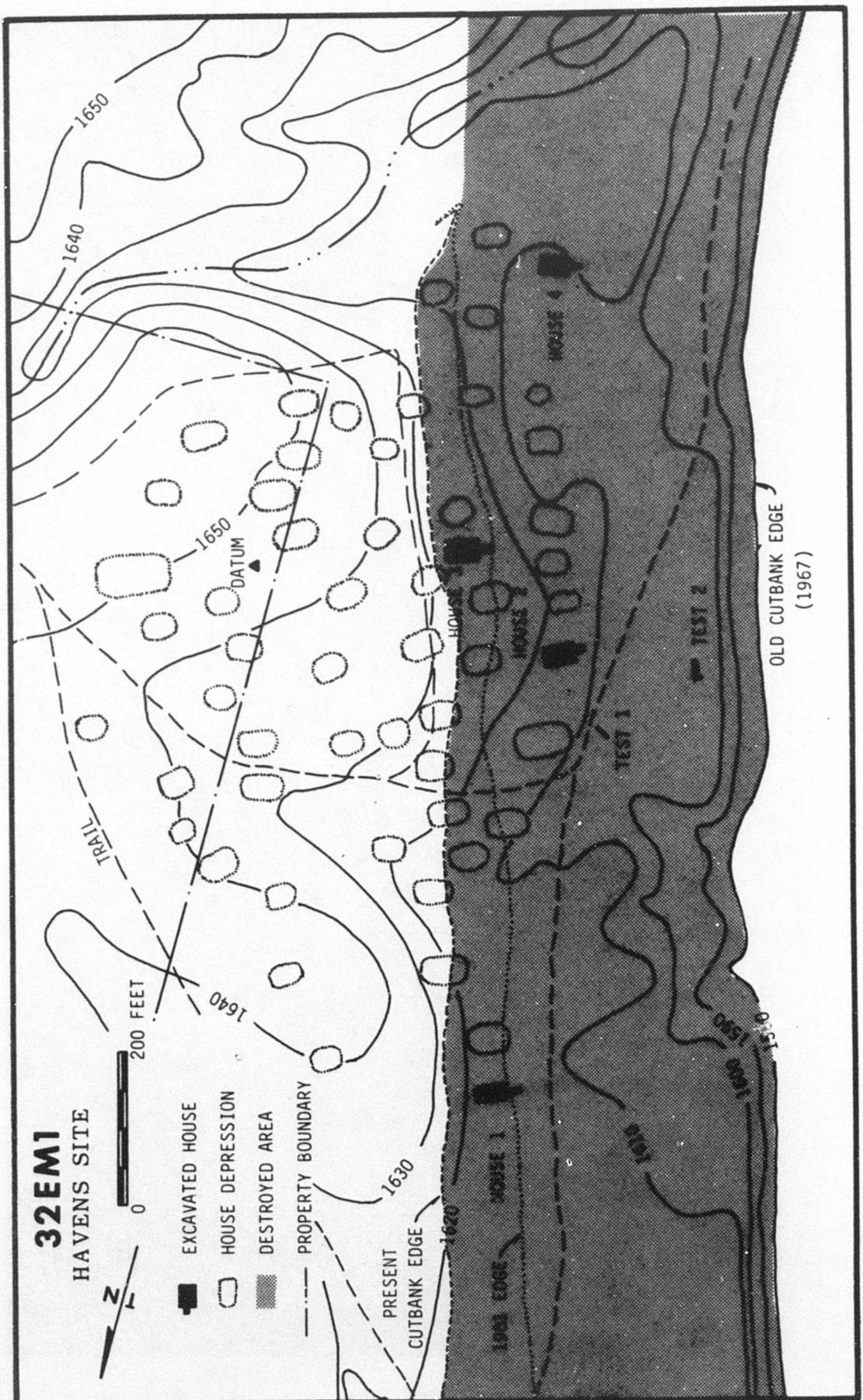


Figure 8.2. Map of the Havens site, 32EM1, showing areas of bank erosion. Map adapted from Sperry (1982).

been washed out from the lodge areas since 1967. It should be noted that this estimate does not include the artifacts which would have been present between the lodges, nor does it include literally millions of pieces of chipped stone debitage, body sherds and unidentifiable bone which would have been present.

At this time it is impossible to estimate if the figures listed above for the Havens site are accurate predictors of what is happening to other sites along the reservoir. However, in the 1983 mapping efforts, emphasis was usually given to mapping the cutbank as it was found to exist at each site. Additionally, a temporary datum stake was left at each of the locations. With this information in hand, it should be possible to set up a bank monitoring program to evaluate the impact of bank erosion at various locations along the reservoir's edge.

Utility of Predictive Models

A question arises relating to the utility of predictive models for areas which have been or will be subjected to one hundred percent inventory. Even if the predictiveness is over eighty percent, as is indicated by the preliminary efforts presented in Chapter Seven, why bother conducting such analyses if the entire area will be subjected to a Class III inventory?

From a long-term management standpoint, it is believed that predictive models can be extremely valuable. Survey efforts along the reservoirs in the Middle Missouri subarea have demonstrated that cultural resource properties are continually being exposed. Even after a modern surface inventory has been completed, the chances of unrecorded sites becoming exposed and ultimately destroyed is very good.

The Corps of Engineers obviously has neither the funding nor the manpower necessary to check all of the cutbanks along all of the reservoirs each year to see where sites have become exposed. If, however, the agency could be supplied with a tabular listing of locations where the probability of a site becoming exposed is quite high, then efforts could be focused at those areas. Such statistics could also be consulted if a land exchange or construction activity is planned for a particular parcel of land.

The nearest neighbor discriminant analysis procedure discussed in Chapter Seven seems to be an ideal technique for these types of applications. This is because, in addition to the summarized results such as those presented in Table 7.2, the statistical package employed also lists the probability of there actually being a site at a "nonsite" location. It is believed that such predictions may be very useful in establishing where buried sites will become exposed in the future.

It is never expected that predictive models will be accurate enough that they can replace cultural resource inventories, and that is certainly not the intent of the study presented in Chapter Seven. The analytical techniques as presented in this report also need to be refined somewhat before they can actually be applied as a management tool. Such findings also need to be tested in areas which were not used in the original formulation of the models. The initial indications do indicate, however,

that these techniques have a great deal of predictive power and could be of help in managing and protecting the cultural resources in the Middle Missouri subarea.

REFERENCES CITED

- Aandahl, Andrew R.
1972 Soils of the Great Plains (map). Andrew R. Aandahl, Lincoln, Nebraska.
- 1982 Soils of the Great Plains. University of Nebraska Press, Lincoln.
- Abel, A.A.
1939 Tabeau's Narrative of Loisel's Expedition to the Upper Missouri. University of Oklahoma Press, Norman.
- Adamczyk, Ted J.
1975 Archaeological Inventory: Missouri River Reach between Fort Benton, Montana and Sioux City, Iowa. Report prepared for the U.S. Army Corps of Engineers, Omaha District.
- Ahler, Stanley A.
1977 Archaeological Reconnaissance and Test Excavation at the Jake White Bull Site, 39C06, Oahe Reservoir, South Dakota. Ms. on file, U.S. Army Corps of Engineers, Omaha, Nebraska.
- Ahler, Stanley A., Chung Ho Lee, and Carl R. Falk
1981 Cross Ranch Archeology: Test Excavations at Eight Sites in the Breaks Zone, 1980-81 Program. University of North Dakota, Department of Anthropology and Archaeology, Contribution No. 154, Grand Forks.
- Ahler, Stanley A., Fred Schneider and Chung Ho Lee
1981 Test Excavations at the Slant Village Site (32M026), Fort Lincoln State Park, North Dakota. Report submitted to the North Dakota State Parks and Recreation Department by the University of North Dakota, Grand Forks.
- Bailey, Vernon
1926 A Biological Survey of North Dakota. North American Fauna No. 49, U.S. Department of Agriculture, Bureau of Biological Survey, Washington, D.C.
- Bailey, R.G.
1980 Descriptions of the Ecoregions of the United States. Miscellaneous Publication No. 1391, U.S.D.A. Forest Service.
- Barett, Ben
1975 In Old Winona. Tracy Printing Company, Minneapolis, Minnesota.

- Bauman, Beth Hughes, and Dorothy K. Jackson
 1978 Burleigh County: Prairie Trails to Highways. Taylor Publishing Company, Dallas.
- Bird, George F., and Edwin F. Taylor
 1972 History of the City of Bismarck, North Dakota: The First 100 Years, 1872-1972. Bismarck Centennial Association, Bismarck.
- Blalock, Hubert M., Jr.
 1972 Social Statistics. McGraw-Hill Book Company, New York.
- Blakeslee, Donald, John Hotopp, Kerry Lippincott, John Ludwickson, and Thomas Witty
 1982 Some Responses to Krause. Plains Anthropologist 27 (95): 83-90.
- Bowers, Alfred W.
 1948 A History of the Mandan and Hidatsa. Ph.D dissertation, Department of Anthropology, University of Chicago.
- Brower, J.V.
 1904 Mandan. Memoirs of Exploration in the Basin of the Mississippi, Volume 8. McGill-Warner, St. Paul, Minnesota.
- Burpee, L.J.
 1927 Journals and Letters of Pierre Gaultier De Verennes De La Verendrye and His Sons. The Champlain Society, Toronto.
- Calabrese, Francis A.
 1972 Cross Ranch: A Study of Variability in a Stable Cultural Tradition. Plains Anthropologist Memoir 9. Lincoln, Nebraska.
- Campbell, J., B. Noisat, and D.T. Hughes
 1983 Archaeological Investigations at the Magpie Road Site (32BI286): An Occurrence of Blackduck Ceramics in the North Dakota Badlands. Report prepared for Tenneco Oil Company by Overland Archaeology, Inc., Boulder, Colorado.
- Carroll, J.M., and L.A. Frost
 1976 Private Theodore Ewert's Diary of the Black Hills Expedition of 1874. C.I.R. Books, Piscataway, New Jersey.
- Chittenden, Hiram Martin
 1902 The American Fur Trade of the Far West. Francis P. Harper, New York.
- 1962 History of Early Steamboat Navigation on the Missouri River, Volume 1. Ross and Haines, Inc. Minneapolis, Minnesota.
- Clayton, Lee, W. B. Bickley, Jr., and W. J. Stone
 1970 Knife River Flint. Plains Anthropologist 15(50):282-290.

- Clayton, L. and S.R. Moran
1971 Late Quaternary Loess in Central North Dakota. Geological Society of America Abstracts 3:256.
- Cooper, Paul L.
1953 Appraisal of the Archaeological Resources of the Oahe Reservoir, North and South Dakota. Report by the Missouri Basin Project, Smithsonian Institution.
- Crawford, Lewis
1931 History of North Dakota. American Historical Society, Chicago.
- Daubenmire, Rexford
1978 Plant Geography. Academic Press, New York.
- De Jong, Gerald Frances
1967 The Dutch in Emmons County. North Dakota History 34.
- Denig, Edwin Thompson
1961 Five Indian Tribes of the Upper Missouri. John C. Ewers, editor. University of Oklahoma Press, Norman.
- Dunn, Adrian R.
1963 A History of Old Fort Berthold. North Dakota History 30 (1).
- Eide, Ingvard Henry (editor)
1969 American Odyssey: The Journey of Lewis and Clark. Rand-McNally, Chicago.
- Emmons County Record
1939 Fire Destroys Halfway House: Old Landmark of Pioneer Days. January 1, page 1.
- Falk, Carl L., and Francis A. Calabrese
1973 Helb: A Preliminary Statement. Plains Anthropologist 18(62): 336-343.
- Fawcett, William B., Jr., and Julie Francis
1981 An Archaeological Survey of Portions of the Medicine Bow National Forest Albany and Carbon Counties, Wyoming. Prepared for USDA Forest Service, Medicine Bow National Forest by the Wyoming Office of State Archaeologist, University of Wyoming, Laramie.
- Frison, George C.
1971 The Buffalo Pound in Northwestern Plains Prehistory: Site 48CA302, Wyoming. American Antiquity 36(1): 77-91.
1978 Prehistoric Hunters of the High Plains. Academic Press, New York.

- Fristad, Palma
1970 Historic Mandan and Morton County. Published by the author,
Mandan, North Dakota.
- Gates, C.M.
1933 Five Fur Traders of the Northwest. University of Minnesota
Press, Minneapolis.
- Great Plains Flora Association
1977 Atlas of the Flora of the Great Plains. University of Iowa
Press, Ames.
- Griffin, David E.
1977 Timber Procurement and Village Location in the Middle
Missouri Subarea. In: Trends in Middle Missouri Prehistory:
A Festschrift Honoring the Contributions of Donald J. Lehmer,
edited by Raymond W. Wood. Plains Anthropologist Memoir 13
(2): 177-185. Lincoln, Nebraska.
- n.d. The South Cannonball Site, 32SI19, Oahe Reservoir, North
Dakota. Manuscript in preparation by the author.
- Hanson, Joseph Mills
1909 The Conquest of the Missouri. A.C. McClury and Company,
Chicago.
- Hanson, Herbert C. and Warren Whitman
1938 Characteristics of Major Grassland Types in Western North
Dakota. Ecological Monographs 8:57-114.
- Hennessy, William B.
1910 History of North Dakota. Bismarck Tribune Company, Bismarck.
- Henning, Darrell D.
1965 The Alkire Mound (32SI200). Plains Anthropologist 10(29):
146-151.
- History of North Dakota Grazing File
n.d.a. North Dakota Writer's Project Records, Historical Data
Project File No. 29. On file at the State Historical Society
of North Dakota.
- n.d.b. Badger-Parkin Cattle Company, North Dakota Writer's Project
Records, Historical Data Project File No. 291. On file at
the State Historical Society of North Dakota.
- Hixon, W. W. and Company
1916 Atlas - North Dakota. W. W. Hixon and Company, Rockford,
Illinois.
- Hoffman, J. J.
n.d. The Ben Standing Soldier Site 32SI17. Incomplete manuscript
in the files of the Midwest Archaeological Center, Lincoln,
Nebraska.

- Howard, James H.
1958 Report of the Investigation of the Tony Glas Site, 32EM3, Emmons County, North Dakota. University of North Dakota, Anthropological Papers, No. 2. Grand Forks.
- 1962 Report on the Investigation of the Huff Site, 32M011, Morton County, North Dakota. Anthropological Papers, No. 2. University of North Dakota, Grand Forks.
- Hudson, J.C.
1969 A Location Theory for Rural Settlement. Annals of the Association of American Geographers 59:365-381.
- Jensen, Ray E.
n.d. Climate of North Dakota. National Weather Service, Fargo, North Dakota.
- Jensen, Richard E.
1965 An Appraisal of the Archeological Resources of the Oahe Reservoir Area in North Dakota: A Supplement. Report by the Missouri Basin Project, Smithsonian Institution.
- Jochim, Michael A.
1976 Hunter-Gatherer Subsistence and Settlement. Academic Press, New York.
- Johnson, Ann M.
1977 Woodland and Besant in the Northern Plains: A Perspective. Archaeology in Montana. 18(1): 27-41.
- Johnson, W.C., R.L. Burgess, and W.R. Keammerer
1976 Forest Overstory Vegetation and Environment on the Missouri River Flood Plain in North Dakota. Ecological Monographs 46: 59-84.
- Kazeck, Melvin E.
1956 North Dakota: A Human and Economic Geography. North Dakota Institute for Regional Studies, Fargo.
- Keammerer, W.R., W. Carter Johnson and R.L. Burgess
1975 Floristic Analysis of the Missouri River Bottomland Forests in North Dakota. Canadian Field-Naturalist 89: 5-19.
- Klecka, William R.
1984 Discriminant Analysis. Quantitative Applications in the Social Sciences, No. 07-019. Sage Publications, Beverly Hills.
- Krause, Richard A.
1969 Correlation of Phases in Central Plains Prehistory. In: Two House Sites in the Central Plains: An Experiment in Archaeology, edited by W. Raymond Wood. Plains Anthropologist Memoir 6(2): 82-96. Lincoln, Nebraska.
- 1977 Taxonomic Practice and Middle Missouri Prehistory: A

Perspective on Donald J. Lehmer's Contributions. Plains Anthropologist Memoir 13(2): 5-13. Lincoln, Nebraska.

- Krieger, Alex D.
1953 New World Culture History: Anglo-American. In: Anthropology Today, edited by A.L. Kroeber, pp. 238-264. University of Chicago Press, Chicago.
- Kuchler, A.W.
1975 Potential Natural Vegetation of the Coterminous United States. 2nd ed. (map). Special Publication 36, American Geographic Society.
- Kvamme, Kenneth L.
1981 Alternative Methodologies for Settlement Pattern Analysis: The Determination of Factors Regulating Prehistoric Site Placement and Site Location Prediction. Paper presented at the annual meeting of the Society for American Archaeology, San Diego.
- Larson, Arthur J.
1931 The Northwestern Express and Transportation Company. North Dakota Quarterly VI: 58-61.
- Larson, Thomas K., Kurt P. Schweigert, Stephen A. Chomko and W. Raymond Wood
1983 A Cultural Resource Inventory of Proposed Recreation Areas, Lake Oahe: Emmons, Morton and Sioux Counties, North Dakota. Report Prepared for the U.S. Army Corps of Engineers, Omaha District by Larson-Tibesar Associates, Laramie, Wyoming.
- Lass, William E.
1962 A History of Steamboating on the Upper Missouri River. University of Nebraska Press, Lincoln.
- Lehmer, Donald J.
1954 Archaeological Investigations in the Oahe Dam Area, South Dakota, 1950-1951. Bureau of American Ethnology Bulletin 158. Washington, D.C.
- 1966 The Fire Heart Creek Site. Smithsonian Institution, River Basin Surveys, Publications in Salvage Archeology, No. 1. Lincoln, Nebraska.
- 1968 The Inter-Agency Archeological Salvage Program in the Middle Missouri Valley. Report prepared for the National Park Service, Washington, D.C.
- 1970 Climate and Culture History in the Middle Missouri Valley. In Pleistocene and Recent Environments in the Central Great Plains, edited by W. Dort, Jr. and J. K. Jones, pp 117-130, University of Kansas Press.
- 1971 Introduction to Middle Missouri Archeology. National Park

1

Service, Anthropological Papers, No. 1. National Park Service, Washington, D.C.

- n.d. Field notes, maps, and artifacts from the 1964 excavations at the Boley Site, Morton County, North Dakota. On file at the Department of Anthropology, University of Missouri, Columbia.
- Leopold, Luna B., M. Gordon Wolman, and John P. Miller
1964 Fluvial Processes in Geomorphology. W.H. Freeman and Company, San Francisco.
- Libby, O.G.
1916 Some Verendrye Enigmas. Mississippi Valley Historical Review III (2): 143-160.
- Lounsberry, Clement A.
1917 North Dakota History and People: Outline of American History. S.J. Clarke Publishing Company, Chicago.
- Mattison, Ray H.
1953 Report on Historical Sites of the Oahe Reservoir Area, Missouri River. Report prepared for the U.S. Army Corps of Engineers.
- 1954 The Army Post on the Northern Plains, 1865-1885. Oregon Trail Museum Association, Gering, Nebraska.
- Medical History of Fort Yates
1878-1903 Records of the Adjutant General's Office, Vols. I and II. National Archives Record Group 94, Roll 4286. State Historical Society of North Dakota, Bismarck.
- Milligan, Edward A.
1976 Dakota Twilight. Exposition Press, Hicksville, New York.
- Mitchell, S. Augustas
1871 County Map of Dakota, Wyoming, Kansas, Nebraska and Colorado. Map on file, State Historical Society of North Dakota, Bismarck.
- Moran, S.R., M. Arnt, J.P. Bluemle, M. Camara, L. Clayton, M.M. Fenton, K.L. Harris, H.C. Hobbs, R. Keatinge, D.K. Sackreiter, N.L. Salomon, and J. Teller
1976 Quaternary Stratigraphy and History of North Dakota, Southern Manitoba, and Northwestern Minnesota. In: Quaternary Stratigraphy of North America, edited by W.C. Mahaney, pp. 133-158. Dowden, Hutchinson and Row, Stroudsburg, Pennsylvania.
- Neuman, Robert W.
1961 Excavations at Four Mound Sites in the Oahe Reservoir. Plains Anthropologist 6 (12-1): 57-58.

- 1
- 1975 The Sonota Complex and Assorted Sites on the Northern Plains.
Nebraska State Historical Society, Publications in Anthropology, No. 6. Lincoln, Nebraska.
- Oder, Naomi Buckley
1976 Glenco Stage Run. Published by the author.
- Ogle, George (editor)
1912 1912 Atlas of Burleigh County. George Ogle and Company, Chicago.
- 1916 1916 Atlas of Emmons County. George Ogle and Company, Chicago.
- Pettermann
1873 Vereinigte Staaten von Amerika in 6 Blattern, BI.2 (Gotha: Justus Perthes). Map on file at the State Historical Society of North Dakota.
- 1879 Vereinigte Staaten von Amerika in 6 Blattern, BI.2 (Gotha: Justus Perthes). Map on file at the State Historical Society of North Dakota.
- Plog, Fred, and James N. Hill
1971 Explaining Variability in the Distribution of Sites. In: The Distribution of Prehistoric Population Aggregates, edited by George J. Gumerman, pp. 7-36. Prescott College Anthropological Reports No. 1. Prescott, Arizona.
- Redmann, R.E.
1975 Productive Ecology of Grassland Communities in Western North Dakota. Ecological Monographs 45: 83-106.
- Reher, Charles A. and D.C. Witter
1977 Archaic Settlement and Vegetative Diversity. In: Settlement and Subsistence Along the Lower Chaco River, Charles A. Reher, editor pp. 113-126. University of New Mexico Press, Albuquerque.
- Reid, Russell
1965 Verendrye's Journey to North Dakota in 1738. North Dakota History 32: 117-129.
- Roberts, Frank H.H., Jr.
1953 Forward. In: River Basin Surveys Papers Numbers 1-6, pp. xiii-xiv. Smithsonian Institution, Bureau of American Ethnology. Bulletin 154.
- Robinson, Elwyn B.
1966 History of North Dakota. University of Nebraska Press, Lincoln.
- 1981 The Themes of North Dakota. North Dakota History 26. State Historical Society of North Dakota, Bismarck.

- Root, Matthew J., and Michael L. Gregg
1983a Archeology of the Northern Border Pipeline, North Dakota: Survey and Background Information. Ms. on File, State Historical Society of North Dakota, Bismarck.
- 1983b Archeology of the Northern Border Pipeline, North Dakota: Test Excavations. Ms. on File, State Historical Society of North Dakota, Bismarck.
- Sanders, Paul H., Marcel Kornfeld, Mary Lou Larson, Stephen A. Chomko, Michael McFaul, Keith H. Dueholm, and Mona C. Thompson.
1982 Results of the 1980 and 1981 Cultural Resource Inventories and Testing of the Kemmerer Coal Company North Block Permit Area: Volume II Prehistory. Prepared for the Kemmerer Coal Company by Larson-Tibesar Associates, Laramie, Wyoming.
- Sanders, William T., Jeffrey R. Parsons, and Robert S. Santley
1979 The Basin of Mexico: Ecological Processes in the Evolution of Civilization. Academic Press, New York.
- SAS Institute
1982 SAS User's Guide: Statistics. SAS Institute, Inc., Cary, North Carolina.
- Scheans, Daniel J.
1957 The Archaeology of the Battle-Porcupine Creek Area, North Dakota. Report submitted to the National Park Service, Omaha, Nebraska by the State Historical Society of North Dakota, Bismarck.
- Schneider, Fred E.
1972 Analysis of Waste Flakes from Sites in the Upper Knife-Heart Region, North Dakota. Plains Anthropologist 17(56):91-100.
- Schweigert, Kurt P.
1979 Historical Cultural Resource Survey of the Upper Souris River, North Dakota. Report prepared for the U.S. Army Corps of Engineers.
- 1983a Historical Architectural Overview of Western North Dakota. Report prepared for the Bureau of Land Management, Dickinson District.
- 1983b Historical Overview. In: A Cultural Resources Inventory of Proposed Recreation Areas, Lake Oahe: Emmons, Morton, and Sioux Counties, North Dakota, edited by Thomas K. Larson, pp. 56-96. Report prepared for the U.S. Army Corps of Engineers by Larson-Tibesar Associates, Laramie, Wyoming.
- Snortland-Coles, J. Signe
1983 A Reassessment of Northern Plains Woodland Burial complexes. Paper presented at the 40th Annual Plains Conference, Calgary, Alberta, Canada.

- Sperry, James H.
1968 The Shermer Site, 32EM10. Plains Anthropologist, Memoir 5.
 Lincoln, Nebraska.
- 1982 The Havens Site (32EM1): 1967 and 1968 Excavations. Report
 submitted to the National Park Service, Denver, Colorado by
 the State Historical Society of North Dakota.
- Sprunk, Larry J.
1976 Jim Gayton interview. North Dakota History 43 (2). State
 Historical Society of North Dakota.
- Steinacker, Terry L.
1981 Archeological Survey and Investigations of Selected Federal
 Lands on the West Bank of the Lake Sharpe/Big Bend Project
 Area, South Dakota: 1980. Report submitted to the U.S. Army
 Corps of Engineers, Omaha District by the Division of
 Archaeological Research, University of Nebraska, Lincoln.
- Stout, Howard R., William F. Freymiller, Francis J. Glatt, Robert D. Heil,
Monte C. McVay, James H. Thiele, and Paul K. Weiser
1974 Soil Survey of Burleigh County, North Dakota. U.S.D.A. Soil
 Conservation Service, Government Printing Office, Washington,
 D.C.
- Strausburg Diamond Jubilee
1976 Strausberg, North Dakota.
- Strong, William Duncan
1940 From History to Prehistory in the Northern Great Plains.
 Smithsonian Institution Miscellaneous Collections 100: 353-
 394. Washington, D.C.
- Thiessen, Thomas D.
1975 The Bendish Site (32M02), Morton County, North Dakota.
 Manuscript on file, Midwest Archaeological Center, Lincoln,
 Nebraska.
- 1976 Middle Missouri Tradition Occupational Sequences for the
 Cannonball and Knife-Heart Regions. M.A. thesis. Department
 of Anthropology, University of Nebraska, Lincoln.
- Thomas, D. and K. Ronnefeldt
1976 People of the First Man. E.P. Dutton, New York.
- Thwaites, Reuben Gold
1906 Early Western Travels, 1794-1897. 33 volumes, New York.
- Trinka, Zena Irma
1920 Out Where the West Begins. The Pioneer Company, St. Paul,
 Minnesota.

- Warren, Gouverneur Kimble
1875 Preliminary Report of Exploration in Nebraska and Dakota, in
the Years 1855-1856-1857. United States Army Engineer
Department, Washington, D.C.
- Wedel, Waldo R.
1961 Prehistoric Man on the Great Plains. University of Oklahoma
Press, Norman.
- Weeden, Mamie L.
n.d. Paha Sapa Tawoyare. Crescent Printing Company, Mandan, North
Dakota.
- Wettlaufer, Boyd
1955 The Mortlach Site in the Besant Valley of Central
Saskatchewan. Saskatchewan Museum of Natural History,
Anthropological Series No. 1.
- Wheeler, George C.
1954 The Amphibians and Reptiles of the North Dakota Badlands.
Theodore Roosevelt Nature and History Association, Medora,
North Dakota.
- Whitman, W.C., and M.K. Wali
1975 Grasslands of North Dakota. In: Prairie: A Multiple View,
K. Mahan, editor, pp 53-73. University of North Dakota
Press, Grand Forks.
- Wilkins, Robert P., and Wyona Huchette Wilkins
1977 North Dakota: A Bicentennial History. W.W. Norton and
Company, New York.
- Will, George F.
1924 Archaeology of the Missouri Valley. American Museum of
Natural History, Anthropological Papers 22 (6).
- Will, George F., and Thad C. Hecker
1944 Upper Missouri River Valley Aboriginal Culture in North
Dakota. North Dakota Historical Quarterly 11 (1-2).
- Will, George F., and Herbert J. Spinden
1906 The Mandans: A Study of their Culture, Archaeology, and
Language. Peabody Museum of American Archaeology and
Ethnology, Harvard University Papers 3 (4), Cambridge,
Massachusetts.
- Willey, Gordon R.
1966 An Introduction to American Archaeology: Volume One North
and Middle America. Prentice-Hall, Inc., Englewood Cliffs,
New Jersey.
- Willey, Gordon R., and Phillip Phillips
1958 Method and Theory in American Archaeology. The University of
Chicago Press, Chicago.

- Williams, Mary Ann Barnes
1961 Origins of North Dakota Place Names. Bismarck Tribune,
Bismarck, North Dakota.
- Winona Times
1884 Vol. III, No. 46, February 2nd.
1888 Vol. IV, No. 16, July 4.
- Wood, W. Raymond
1960 The Boundary Mound Group (32SI11): An Eastern Woodland Complex in North Dakota. Plains Anthropologist 5 (10): 71-78.
- 1967 An Interpretation of Mandan Culture History. Bureau of American Ethnology Bulletin 198. Washington, D.C.
- 1974 Northern Plains Village Cultures: Internal Stability and External Relationships. Journal of Anthropological Research 30(1): 1-16.
- 1978 Notes on the Historical Cartography of the Lake Sharpe Area, South Dakota. Report submitted to the Midwest Archaeological Center, Lincoln, Nebraska.
- 1983 Prehistoric/Protohistoric Culture History. In: A Cultural Resources Inventory of Proposed Recreation Areas, Lake Oahe: Emmons, Morton, and Sioux Counties, North Dakota, edited by Thomas K. Larson, pp. 26-37. Report prepared for the U.S. Army Corps of Engineers, Omaha District by Larson-Tibesar Associates, Laramie, Wyoming.
- Wood, W. Raymond, and Alan R. Woolworth
1964 The Paul Brave Site (32SI4), Oahe Reservoir Area, North Dakota. Bureau of American Ethnology Bulletin 189:1-65. Washington, D.C.
- Woods, Ellen, and Euvagh Wenzel
1976 A History of Emmons County. Emmons County Historical Society, Linton, North Dakota.
- Woolworth, Alan R., and W. Raymond Wood
1964 The Demery Site (39C01), Oahe Reservoir Area, South Dakota. Bureau of American Ethnology Bulletin 189:67-138. Washington, D.C.
- Wroblewski, David V., and Nordan J. Lunde
1980 Soil Survey of Emmons County, North Dakota. U.S.D.A. Soil Conservation Service, Government Printing Office, Washington, D.C.
- Zeier, Charles D.
1982 The Willey and Phillips System Revisited: A Proposed Expansion of the Paradigm. Plains Anthropologist 27: 29-36.